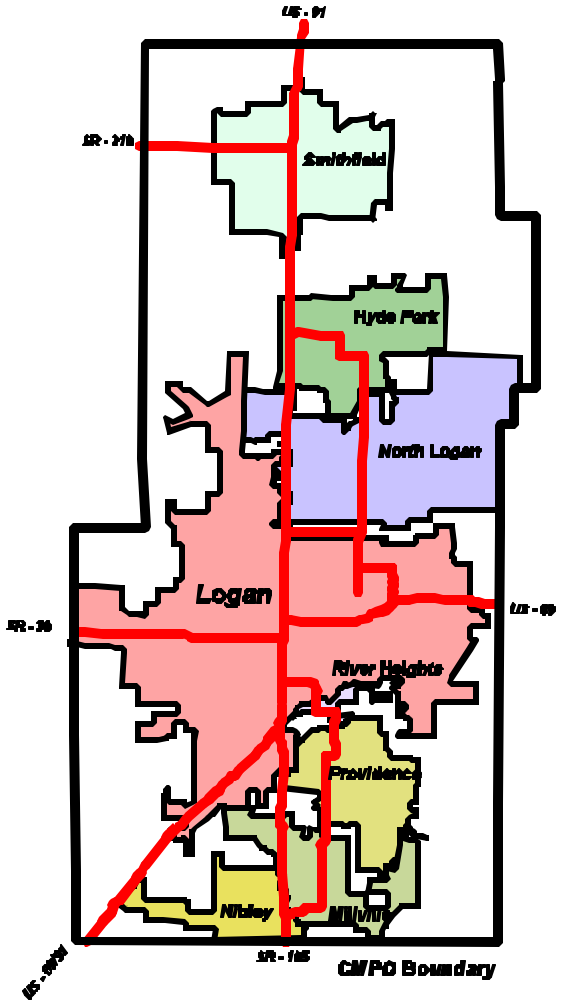
CMPO

CACHE METROPOLITAN
PLANNING ORGANIZATION

CMPO 2025 LONG RANGE TRANSPORTATION PLAN



June 2000

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FINAL
CMPO 2025 LONG RANGE TRANSPORTATION PLAN

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Logan Transit District, Utah Department of Transportation, Entranco, Wilbur Smith Associates, and SWCA

June 2000

RESOLUTION 2000-10
Approving The CMPO 2025 Long Range Transportation Plan

WHEREAS, the Cache Metropolitan Planning Organization is responsible for preparing a multimodal long range transportation plan for the Logan Urbanized Area according to the Transportation Equity Act for the 21st Century, and

WHEREAS, as a condition of receiving Federal Highway Trust Fund funds for the urbanized area, a long range transportation plan must be prepared and/or updated every three to five years, and

WHEREAS, the City of Logan Transit Department and the Utah Department of Transportation have participated in the development of the CMPO 2025 Long Range Transportation Plan, and

WHEREAS, the CMPO 2025 Long Range Transportation Plan is consistent with the projected Federal funds made available through the Utah Department of Transportation.

NOW THEREFORE LET IT BE RESOLVED that the Cache Metropolitan Planning Organization (1) approves the CMPO 2025 Long Range Transportation Plan, (2) certifies that the CMPO 2025 Long Range Transportation Plan contains no activities undertaken to influence a member of congress, employees of congress, or employees of federal agencies in connection with the awarding of federal funds.

Mark E. Daines, Chairman
Cache Metropolitan Planning Organization

James Gass, Executive Director
Cache Metropolitan Planning Organization

June 5, 2000
Date

CMPO 2025 Long Range Transportation Plan

Signature Page

The citizens of the Logan Urbanized Area and the CMPO members were an important part of the development team for this Plan. The CMPO Executive Council, Technical Advisory Committee, and staff all dedicated time, effort, and guidance to help create an innovative process. This led to a plan that truly reflects and embodies the vision of the region and each community.

Based on the recommendations from the CMPO Executive Council, Technical Advisory Committee, and staff, the CMPO Executive Council hereby adopts the CMPO 2025 Long Range Transportation Plan:

June 5, 2000

Mayor Mark E. Daines
Chairman
Hyde Park

Mr. Jim Gass, P.E.
Executive Director

Mr. Stephen M. Bodily
Transportation Commissioner

Mayor Ralph Degn
River Heights

Mayor Jack R. Draxler
North Logan

Mayor Gale J. Hall
Millville

Mr. Tom Kerr
Logan City Council

Mr. Lynn Lemon
Cache County Executive

Mayor Alma H. Leonhardt
Providence

Mr. David Mortenson
Millville

Mayor H. Jay Nelson
Nibley

Mr. Geoff Straw
Logan Transit District

Mayor Douglas E. Thompson
Logan

Mayor Kent F. Ward
Smithfield

Executive Summary

Overview

The Cache Metropolitan Planning Organization (CMPO), established in 1992, directs the transportation planning efforts of the Logan Urbanized Area (LUA), which was designated by the Governor after the 1990 census. The CMPO, in cooperation with the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Utah Department of Transportation (UDOT), and the Logan Transit District (LTD), is required to complete a metropolitan transportation plan to ensure continued federal funding of transportation projects within the LUA. This is a specific requirement of the 1998 Transportation Equity Act for the 21st Century (TEA-21). This document is the CMPO 2025 Long-Range Transportation Plan (LRP).

The LRP includes financially constrained projects and financially unconstrained projects. The Financially Constrained Plan (FCP) identifies projects that can be constructed in the next 25 years using federal and local funds. This is the starting point of the CMPO's implementation plan. Changes in funding, public opinion, technology, and/or transportation mode preference may change the FCP in future years. Projects from the unconstrained list may be brought forward into the FCP as needed. It is also possible for projects from the unconstrained list to be constructed using non-federal sources such as state, local, and/or private funding.

The LRP recommends transit and roadway improvements to help meet the transportation needs of the LUA through 2025. Transit improvement projects are identified in the 1996 CMPO Short-Range Transit Plan. These transit projects were incorporated into the LRP as part of the FCP. The roadway projects include road improvements or new roads and

Transportation System Management (TSM) projects. The road improvement projects address long term congestion mitigation needs through 2025. The TSM projects address short-range needs for preserving the capacity of existing facilities, increasing traffic safety, and reducing travel delays.

During individual project development, roadway and transit improvements will consider bicycle and pedestrian needs with the goal of accomplishing an intermodal transportation system. The CMPO and its member jurisdictions will continue to apply for special federal, state, local, and private funds for motorized and non-motorized transportation system improvement projects.

Project Evaluation Results

Table E-1 lists the roadway projects that constitute the FCP and are a subset of the LRP. Table E-2 lists the Top 10 projects along with their ranking scores and cost estimates. The FCP roadway projects are shown in red in Table E-2 and are marked with (***) in the "CMPO Funded Projects" column. Priority projects/segments in the unconstrained list are shown in black ink in Table E-2. UDOT's planned projects in the LUA are not listed in the LRP because the focus is on CMPO and locally funded projects. Figure E-1 shows the Top 10 roadway projects included in the LRP.

The FCP includes the following transit system improvements:

a. Bus benches
b. Bus shelters
c. Street furniture
d. Replacement and expansion buses
e. Cache Valley Transit District (CVTD) service expansion project
f. Automated Vehicle Locator and Advanced Traveler Information Systems
g. Operating costs

TABLE E-1 FINANCIALLY CONSTRAINED ROADWAY PROJECTS (FCP)

Rank	Project	Jurisdiction	Segment Limits	Cost (millions)
TSM #1	Main Street Parking Replacement	Logan	400 North - 1400 North	$0.27
TSM #2	Signal Coordination	Logan/North Logan	800 South - 1800 North [5]	$1.00
TSM #3	Main Street Intersection Improvements	Logan Logan	1400 North 400 North	$1.09 $0.47
TSM #4	Main Street Access Management	Logan Logan Logan Logan Logan/North Logan	800 South - 450 South [1] 450 South - 50 South [1] 50 South - 450 North [1] 450 North - 850 North [1] 850 North - 1800 North [1]	$0.36 $0.62 $0.45 $1.09 $2.21
Build #1	100 East	River Heights Logan Logan	700 South - 450 South 450 South - Center Street Center Street - 400 North	$0.91 $1.42 [2] $0.02 [3]
Build #3	400 East	Providence Logan Logan	500 North(M) - 300 South(P) 300 South - Center Street Center/400 E - 400 N/600 E	$2.02 $2.92 $5.43
Build #4	400 West	N Logan/Hyde Park Hyde Park H Park/Smithfield	2500 North - 3700 North [4] 3700 North - 4600 North 4600 North - 600 South (S) [5]	$6.58 $4.65 $1.57
Build #5	200 East (North)	North Logan N Logan/Hyde Park Hyde Park H Park/Smithfield Smithfield	1400 North - 2500 North 2500 North - 3700 North [5] 3700 North - 4400 North 4400 North - 600 South (S) [5] 600 South(S) - 400 South(S)	$4.66 $5.61 $2.65 $1.86 $0.70
(S) - Smithfield, (P) - Providence, (M) - Millville			**TOTAL COST = $49 million**	

NOTES:

1 - Segmentation based on crash analysis ('95-'98)

2 - Cost reflects signing and restriping only (Center St-300 South), reconstruction (300 South-450 South), and a new bridge over the Logan River

3 - Cost reflects signing and restriping only

4 - Segment is multi-jurisdictional; more feasible to segment this way because east/west road exists at 3700 North, but not at the boundary between North Logan and Hyde Park (2900 North)

5 - Segment is multi-jurisdictional; recommendations are based on traffic model results

TABLE E-2 FINAL ROADWAY PROJECT RANKING - "TOP 10 PROJECTS"

Project Rank [1] (score)	Project	Jurisdiction	Segment Limits	Segment Rank [1] (score)	Segment Cost (millions)	Project Cost (millions)	CMPO Funded Projects
TSM #1 (0.708)	**Main Street Parking Replacement**	Logan	400 North - 1400 North	1	$0.27	$0.27	***
TSM #2 (0.553)	**Signal Coordination**	Logan/North Logan [7]	800 South - 1800 North	1	$1.00	$1.00	***
TSM #3 (0.504)	**Main Street Intersection Improvement**	Logan	1400 North	1 [3]	$1.09	$1.56	***
		Logan	400 North	2 [3]	$0.47		***
TSM #4 (0.183)	**Main Street Access Management**	Logan	800 South - 450 South [2]	5	$0.36	$4.73	***
		Logan	450 South - 50 South [2]	4	$0.62		***
		Logan	50 South - 450 North [2]	1	$0.45		***
		Logan	450 North - 850 North [2]	3	$1.09		***
		Logan/N Logan	850 North - 1800 North [2]	2	$2.21		***
Build #1 (0.581)	**100 East**	Providence	100 North (P) - 700 South	**2** (0.399)	$1.87	$3.52	
		River Heights	700 South - 450 South	**1** (0.536)	$0.91		***
		Logan	450 South - Center Street	**4** (0.094)	$1.42 [4]		***
		Logan	Center Street - 400 North	**3** (0.234)	$0.02 [5]		***
Build #2 (0.333)	**200 East (South)**	Millville	200 South (M) - 500 North (M)	**4** (0.375)	$2.64	$16.13	
		Providence	500 North (M) - 300 South (P)	**2** (0.516)	$2.44		
		Providence	300 South (P) - 700 South	**1** (0.524)	$3.68		
		River Heights	700 South - 350 South	**3** (0.456)	$2.10		
		Logan	350 South - 400 North	**5** (0.336)	$5.27		
Build #3 (0.290)	**400 East**	Millville	200 South (M) - 500 North (M)	**6** (0.091)	$2.00	$19.75	
		Providence	500 North (M) - 300 South (P)	**5** (0.106)	$2.02		***
		Providence	300 South (P) - 700 South	**3** (0.352)	$4.04		
		River Heights	700 South - 300 South	**4** (0.139)	$3.34		
		Logan	300 South - Center Street	**2** (0.452)	$2.92		***
		Logan	Center/400 E - 400 N/600 E	**1** (0.529)	$5.43		***
Build #4 (0.278)	**400 West**	N Logan/Hyde Park	2500 North - 3700 North [6]	**2** (0.273)	$6.58	$12.80	***
		Hyde Park	3700 North - 4600 North	**3** (0.196)	$4.65		***
		H Park/Smithfield	4600 North - 600 South (S) [7]	**1** (0.583)	$1.57		***
Build #5 (0.268)	**200 East (North)**	Logan	400 North - 1400 North	**6** (-0.033)	$5.71	$21.19	
		North Logan	1400 North - 2500 North	**4** (0.314)	$4.66		***
		N Logan/Hyde Park	2500 North - 3700 North [7]	**5** (0.175)	$5.61		***
		Hyde Park	3700 North - 4400 North	**2** (0.495)	$2.65		***
		H Park/Smithfield	4400 North - 600 South (S) [7]	**1** (0.564)	$1.86		***
		Smithfield	600 South (S) - 400 South (S)	**3** (0.489)	$0.70		***
Build #6 (0.213)	**200/400 North**	Logan	200 N/1500 W - 400 N/Main	1	$7.46	$7.46	see note #8

NOTES:

1 - Ranking based on Evaluation Matrix Categories and Criteria. Scores for TSM and build projects cannot be compared to each other

2 - Segmentation and ranking based on crash analysis ('95-'98)

3 - If the 200/400 North project is constructed first, the 400 N intersection should be widened before 1400 N

4 - Cost reflects re-striping and signing only (Center St-300 South); reconstruction (300 South-450 South) and new bridge over Logan River

5 - Cost reflects re-striping and signing only

6 - Segment is multi-jurisdictional; more feasible to segment this way because east/west road exists at 3700 N, but not at the boundary between North Logan and Hyde Park (2900 N)

7 - Segment is multi-jurisdictional; recommendations are based on traffic model results

8 - The 200/400 North project is currently on the UDOT STIP; it will be funded separately so it is not included in the project/funding totals

(S) - Smithfield, (P) Providence, (M) Millville

Total Cost for all roadway projects = $81 million

Total Cost for CMPO Funded Projects* = $49 million**

CMPO Projected Federal Funding through 2025 = $ 51 million

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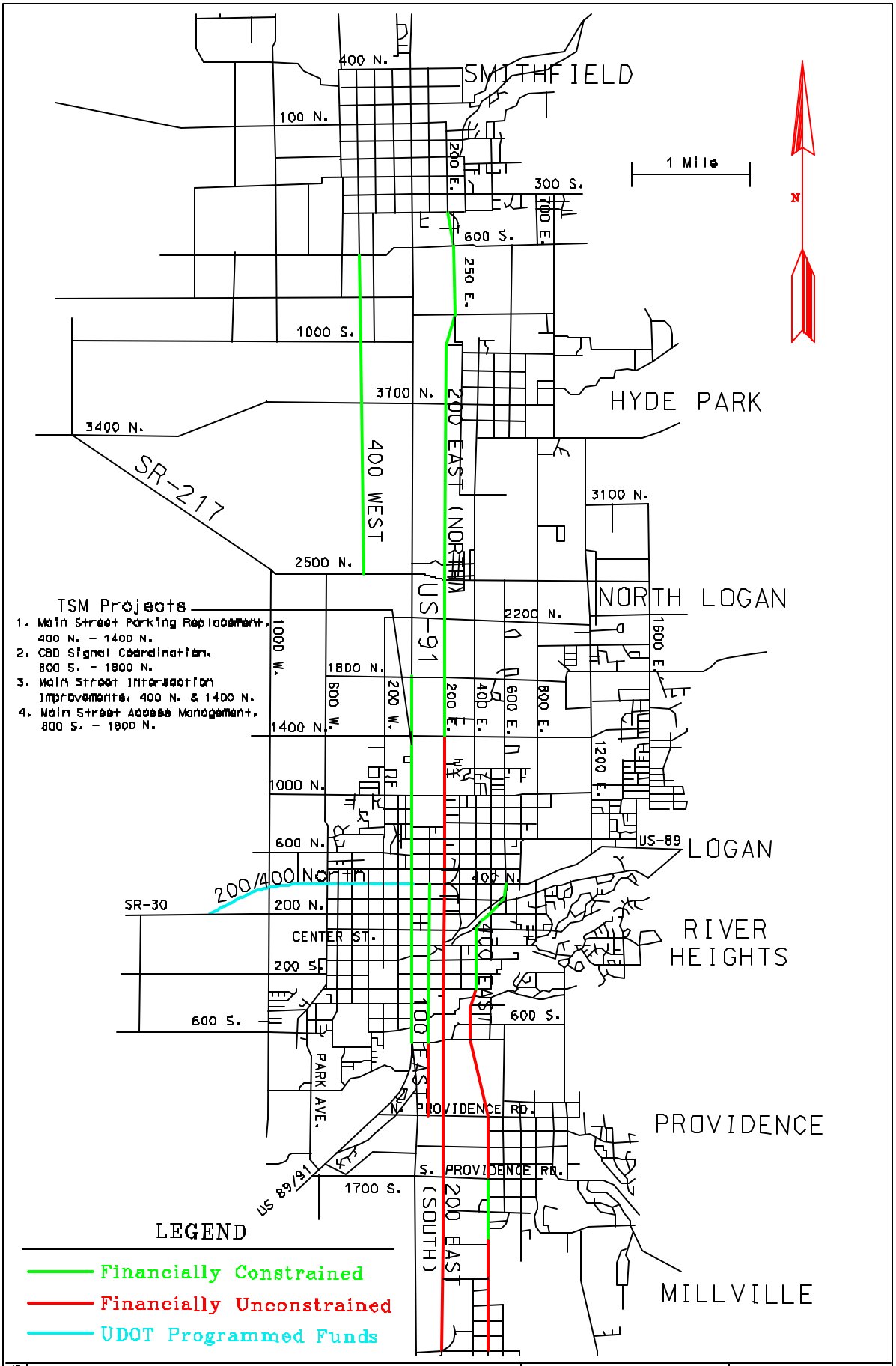

5/10/00	FIGURE E-1 TOP 10 PROJECTS - MAP	CVC - PHASE 2	MK CENTENNIAL ENGINEERING INC

Impact on Future Congestion

The LUA is experiencing traffic congestion, increased travel time, and high traffic crash rates. If road or TSM improvements are not made, congestion will continue to grow over the next 25 years as shown in Figure E-2. This is called the Baseline Alternative and it represents the No-Build Alternative. Figure E-3 shows future congestion levels if the FCP projects and segments are implemented. Figure E-4 shows future congestion if the Top 10 projects are implemented. A comparison of Figures E-3 and E-4 demonstrates that congestion reduction can be accomplished by implementing as many of the Top 10 projects as possible. Road improvements included in the FCP will help moderate the congestion level and maintain the quality of life.

Funding

This report also documents the Financial Plan (FP) for the LRP, which provides estimates of future revenue from potential revenue sources. Table E-3 summarizes the estimated transportation funding for the next 25 years. This plan assumes that $3 million in discretionary funding will be obtained over the course of the next three federal transportation funding re-authorization bills. This is a reasonable assumption based on the LUA's history of obtaining discretionary funds. For example, the community obtained $8 million of discretionary funds under TEA-21 for the "Cache Valley Highway" project.

TABLE E-3 PROJECTED REVENUE SUMMARY 1998-2025

Source	**Roadway** (millions)	**Transit** (millions)
Federal Funds	$ 51 *	$ 22
State Funds	$148	$ 0
Local B (County) and C (City) Funds	$336	$ 0
TOTAL ESTIMATED REVENUES	**$535**	**$ 22**

* Assumes $3 million in discretionary federal funding earmarked for specific CMPO roadway projects.

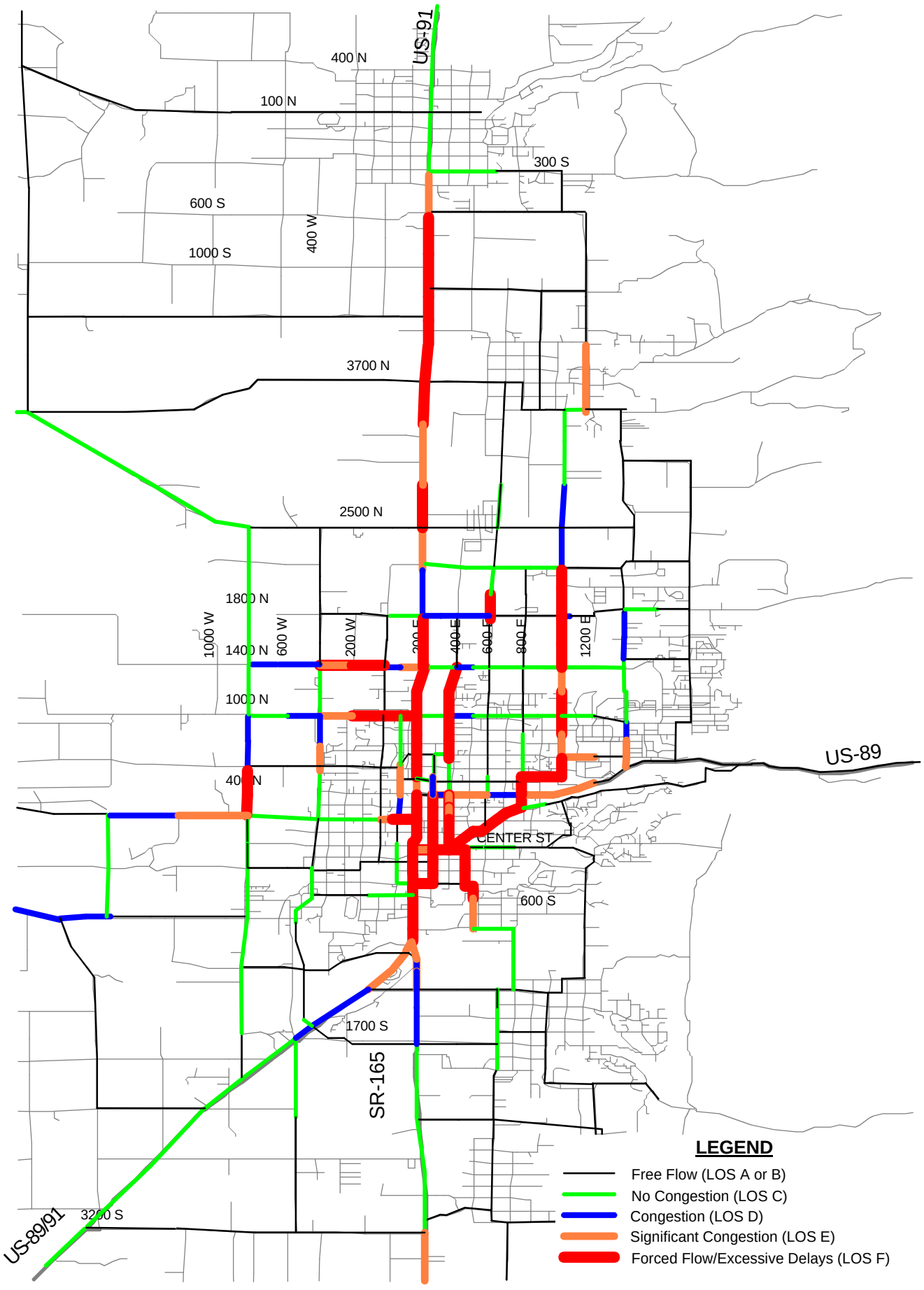

FIGURE E-2

YEAR 2025 CONGESTION MAP
"NO BUILD" ALTERNATIVE

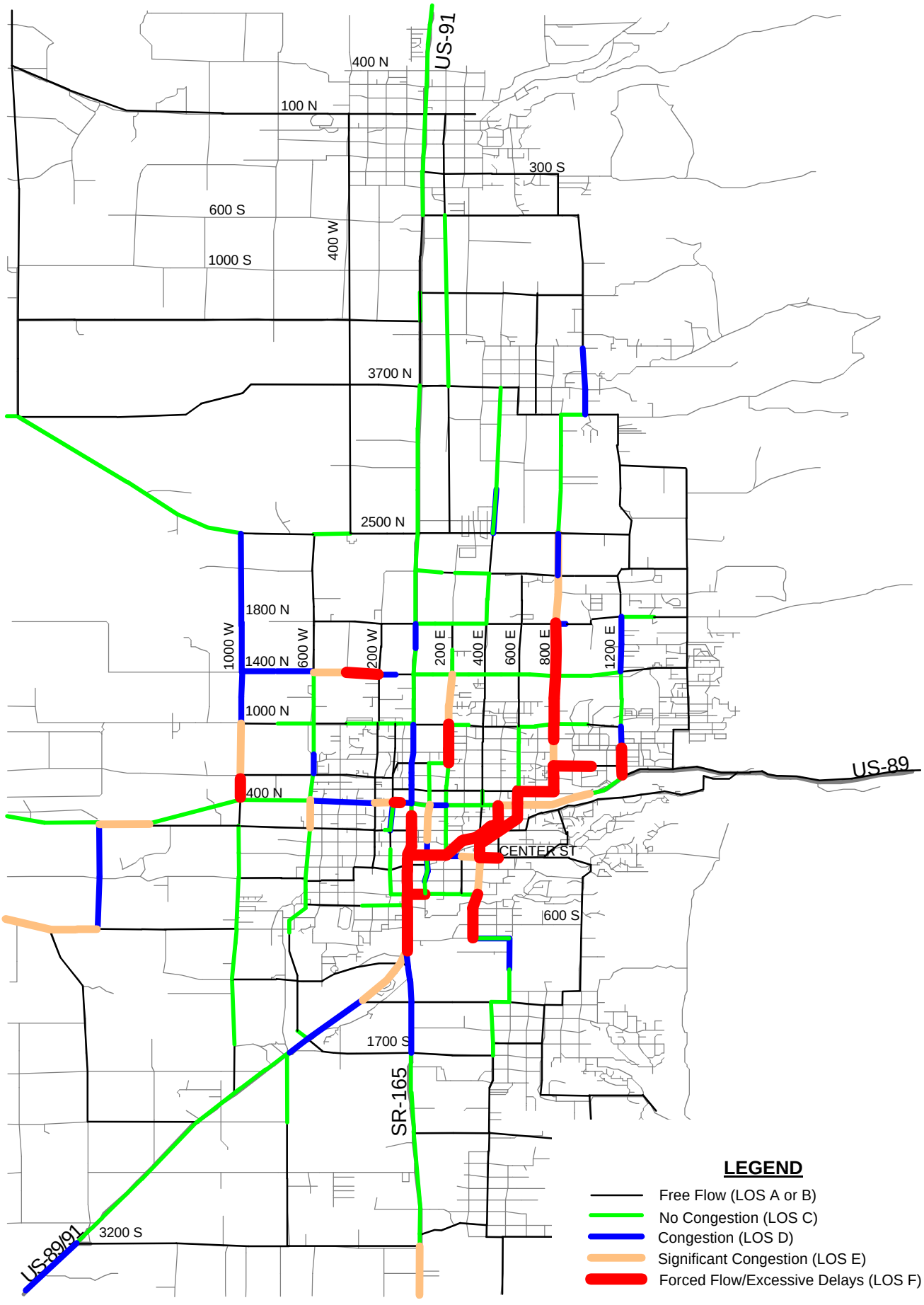

FIGURE E-3

YEAR 2020 CONGESTION MAP WITH FCP PROJECTS

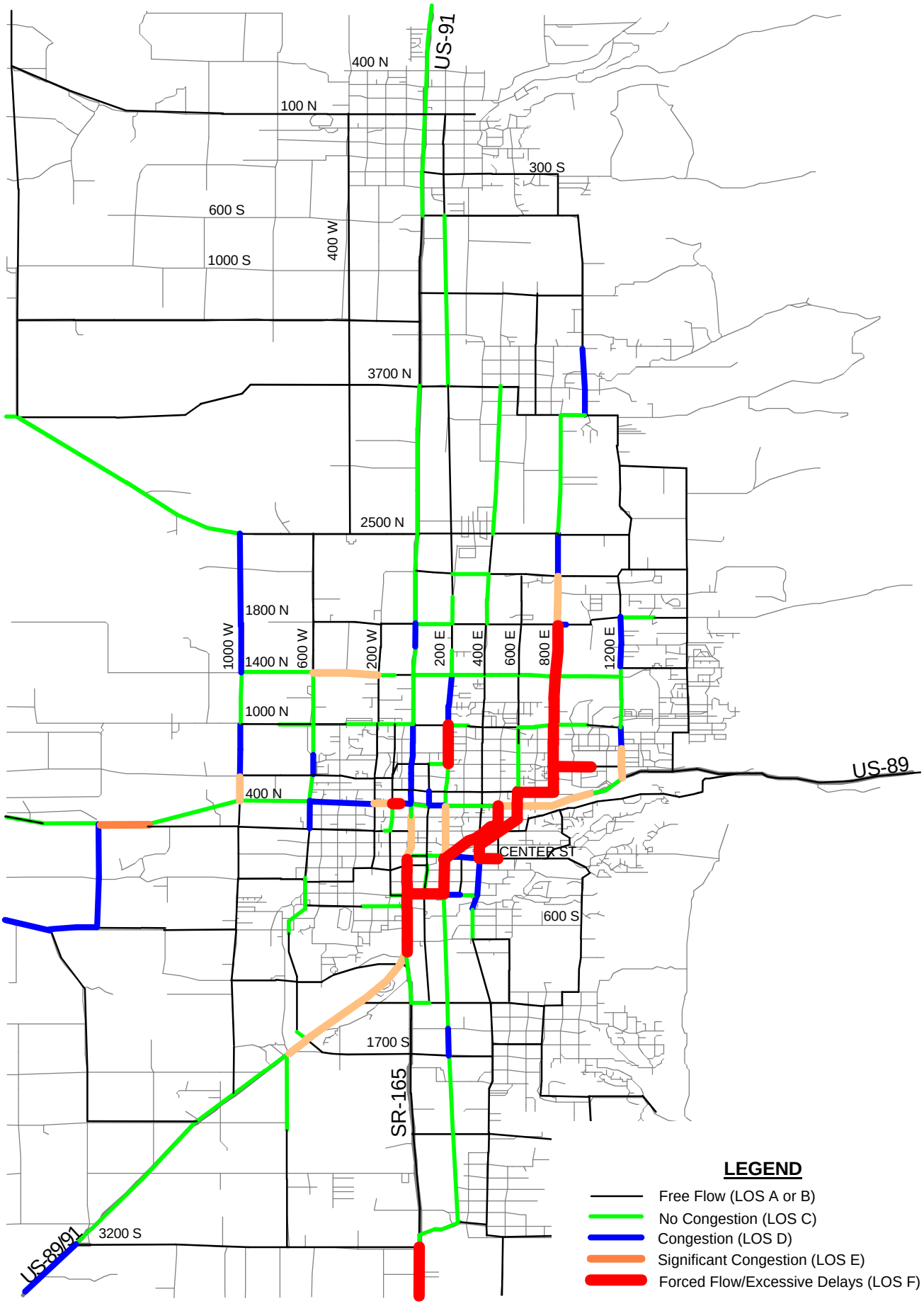

FIGURE E-4

YEAR 2025 CONGESTION MAP WITH TOP 10 PROJECTS

Planning Process

Engineering judgement and planning intuition were the basis for project selection in the previous LRP. This LRP is based on a combined analysis of traffic, social, and economic data. The process of developing this LRP considered all modes of transportation in a continuing, cooperative, and comprehensive manner to address the transportation problems of the LUA. The following process was used to develop the LRP.

1. Develop a computerized Travel Demand Forecasting (TDF) model that simulated the land use, transit system, and roadway network in the existing and future conditions.
2. Use the model to identify roadway and transit projects that have mobility benefits.
3. Identify the project evaluation criteria (See Table E-4).
4. Quantify the costs and potential impacts of the identified projects.
5. Identify issues and concerns for each project through public outreach and resource agency coordination.
6. Review of project alternatives by a team of citizens, elected and appointed officials, and state government representatives. These representatives met on a regular basis to review the LRP development process.
7. Use detailed traffic data and other preliminary data (social, environmental, and cost estimates) of each project to determine the final ranked set of projects that best met pre-determined evaluation criteria.
8. Select a set of projects from the Top 10 list to create the FCP, which matches available funding.
9. Consider final public input through a formal public review and comment period.

Once the LRP has been adopted, the CMPO must prepare an annual Transportation Improvement Program (TIP) that identifies specific projects to be implemented during the

next three to five years. The TIP must be updated at least every two years and include public review and hearings. It must be financially constrained by year and include a financial plan which demonstrates that the projects can be implemented using the current and projected revenue sources. UDOT's roadway projects are not included in this plan so as not to deviate from the focus of CMPO's projects.

TABLE E-4 EVALUATION CRITERIA

CATEGORY		CRITERIA	
Description	Importance[1]	Description	Weight Factor[2]
Mobility	30%	* System delays (% vehicle hours reduced) * US-91 ("Y" to 1800 No.) delays (% vehicle hours reduced) * System congestion (% vehicle hours reduced) * Community linkage (number of communities linked) * Crash rate and severity (rate reduction) * Transit use (judgement) * Overall fit with community transportation plans (% matching)	5 3 3 5 2 3 1
Environmental Impacts	10%	* Wetland and wildlife habitat (acres) * Hazardous materials (factor = # sites, size, severity) * Historic structures (number) * Public facility impacts (number and type)	4 5 2 1
Socioeconomic Impacts	10%	* Encourage development per community land use plans (judgement) * Project sponsorship (yes/no) * Private displacement (number) * Neighborhood impacts - noise, etc (judgement)	2 3 5 2
Cost Effectiveness	40%	* Cost Effectiveness (% vehicle hours reduced per dollar)	5
Engineering	10%	* Construction impacts (judgement) * Floodplain (cubic feet) * Drainage structures (number and type) * Right-of-way (acres)	1 2 1 3

Notes:
1 - Category Importance must add up to 100%
2 - Criteria Weight Factors range from low =1 to high = 5

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GLOSSARY OF ACRONYMS AND TERMS

ADA	American's with Disabilities Act of 1990
ADT	Average Daily Traffic
AVL	Automated Vehicle Locator
CBD	Central Business District
CMPO	Cache Metropolitan Planning Organization
CTAC	Cache Technical Advisory Committee
CVTD	Cache Valley Transit District
FCP	Financially Constrained Plan
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
ITS	Intelligent Transportation Systems
LOS	Level of Service
LRP	Long Range (Transportation) Plan
LTD	Logan Transit District
LUA	Logan Urbanized Area
MINUTP	Modeling, individual computer, Urban Transportation Planning
Model	Cache Valley Travel Demand model
MOE	Measure of Effectiveness
MPO	Metropolitan Planning Organization
ROW	Right-of-way
STP	Surface Transportation Program, a federal funding category.
SYNCHRO	Traffic Signal Timing, Coordination, and Capacity Analysis software
TAZ	Traffic Analysis Zone
TEA-21	The 1998 Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Program
TSM	Transportation System Management
UDOT	Utah Department of Transportation
USU	Utah State University

Introduction

CMPO

The Cache Metropolitan Planning Organization (CMPO) was established in 1992 to address the transportation needs of the Logan Urbanized Area (LUA). The LUA was established after the 1990 census. The LUA, an area of about 75 square miles (see Figure 2-1 on page 10), extends from north of Smithfield on the north, to the middle of Nibley on the south, and from the national forest boundaries on the east to west of Logan. The CMPO, in cooperation with the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Utah Department of Transportation (UDOT), and the Logan Transit District (LTD) is responsible for carrying out the metropolitan transportation planning process. The metropolitan transportation plan and any periodic updates must be approved by the CMPO. Transportation planning responsibilities for all metropolitan planning organizations (MPO) are established by federal law and regulations.

Long-Range Transportation Plan

As the designated urbanized area authority, the CMPO must complete a metropolitan transportation plan (herein referred to as the CMPO Long-Range Transportation Plan or LRP) to ensure continued federal funding of transportation projects within the LUA. This is a specific requirement of the federal law known as the Transportation Equity Act for the 21st Century (TEA-21). This document serves as the LRP.

The LRP must be the result of a continuing, cooperative, and comprehensive transportation planning process which considers all transportation modes and supports the metropolitan community development and social goals. The CMPO, UDOT, and the LTD

must cooperatively determine their mutual responsibilities in the planning process. They must work together to develop the LRP and annual Transportation Improvement Program (TIP). According to TEA-21, the transportation plans and programs which are developed by the MPO must lead to the development and operation of an integrated multimodal transportation system that facilitates the efficient and economic movement of people and goods.

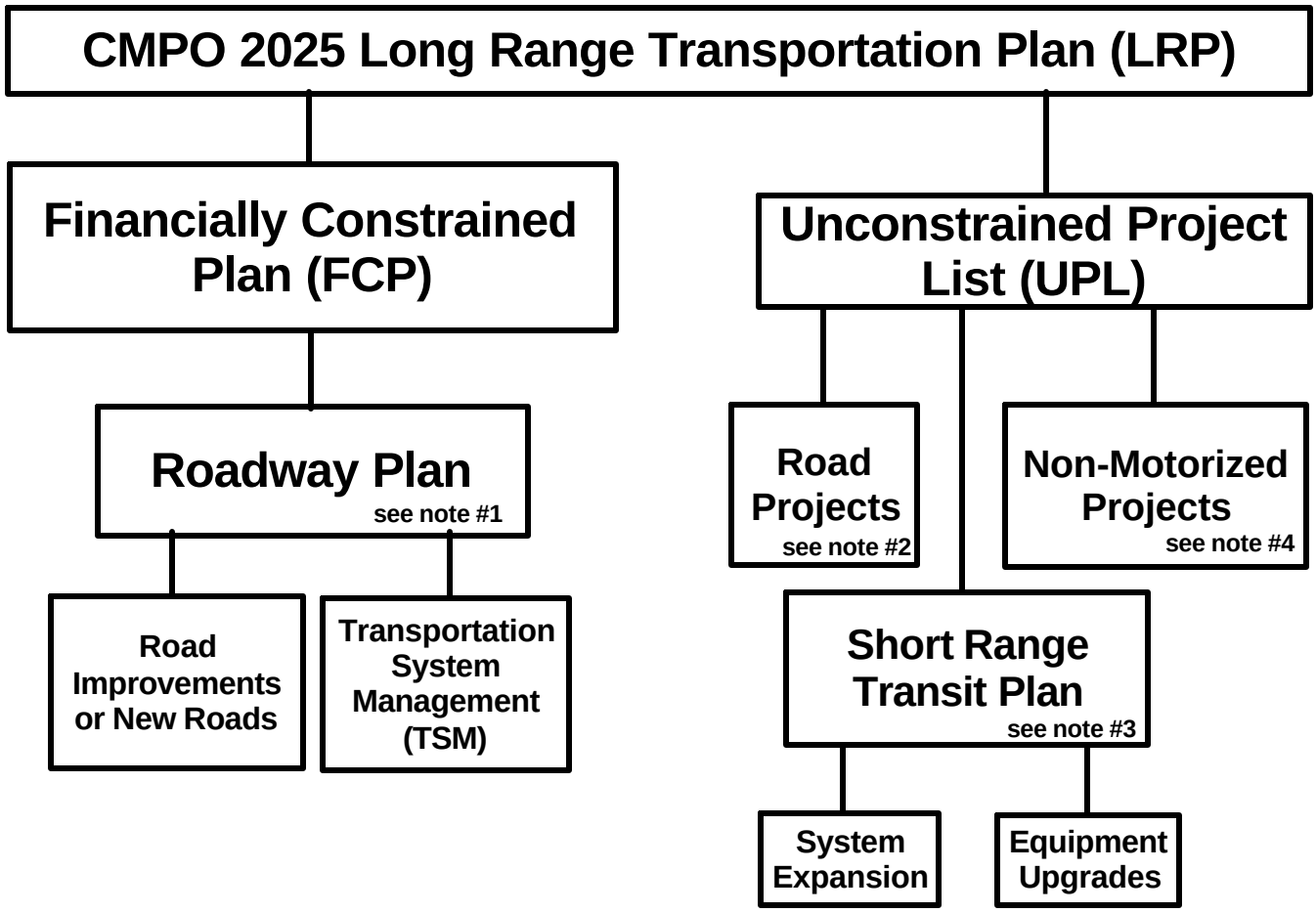
The LRP consists of a Financially Constrained Plan (FCP) (Section 8) and an Unconstrained Project List (UPL) (Section 9). The FCP recommends roadway improvements to meet the transportation needs of the area over a 25-year period. Many transit projects are identified in the Logan Urbanized Area Short-Range Transit Plan (1996) (Appendix E) with service expansion projected to meet the needs over the next 25 years. The roadway plan includes road improvement projects and Transportation System Management (TSM) projects. The road improvement projects address congestion mitigation issues through 2025. The TSM projects address the shorter-range needs for preserving existing facilities, increasing safety, and reducing delays. See Figure 1-1 on the next page for a diagram of the Transportation Plan Format.

Planning Process

Engineering judgement and planning intuition were the basis for project selection in the CMPO's previous LRP. This LRP is based on a combined analysis of traffic, social, and economic data. The process of developing this LRP considered all modes of transportation in a continuing, cooperative, and comprehensive manner to address the transportation problems of the LUA.

The first step of the planning process was to develop a travel demand forecasting model (Model) using state of the art methodology and software that simulates anticipated land use and the roadway network for existing and future conditions. The Model is based on

Figure 1-1 Transportation Plan Format



Notes

1. The Roadway Plan is constrained by available Federal Funds through FHWA
2. Unconstrained Road projects could be funded from local governments or private sources
3. The Transit Plan is constrained by available Federal funds through FTA
4. Unconstrained Non-Motorized Projects could be funded by federal enhancement funds, local government, or private sources

FIGURE 1-1 TRANSPORTATION PLAN FORMAT

existing travel modes and patterns and was used to identify future congestion areas and to evaluate congestion mitigation measures.

At the beginning of the LRP update, the process to expand the transit system was underway and a non-motorized transportation plan had been developed. Therefore, the Model used multi-modal information to identify roadway improvement projects that would provide the greatest mobility benefit.

The second step was to quantify the costs and impacts of those projects with mobility benefits. The project impacts and cost estimates were based on conceptual engineering (see Appendix D).

Public information meetings and resource agency coordination occurred throughout the LRP development in order to identify issues and concerns. A team of local and state government representatives met on a regular basis to guide the process towards locally preferred alternatives. These representatives (see Appendix H) identified the criteria for the evaluation of alternatives.

The third step was to use detailed traffic data and other preliminary data (social, environmental, and cost estimates) for each project to determine the final set of projects that best satisfied the evaluation criteria. An Evaluation Matrix was developed as the tool for the comparison of alternatives, which resulted in a “technical” ranking of the final projects (see Appendices C and D).

The final step was to reduce the project list to a point where the remaining projects could be constructed using anticipated future CMPO funding. Three filters were applied to the project list to create the FCP; including sponsorability by local governments, identification of projects that could be constructed without federal funds, and modification of design/cost assumptions to maximize use of existing roadway infrastructure.

TEA-21 requires that a financial plan be part of the overall transportation plan for a region. This ensures that the recommended improvements included in the plan can be implemented given the projected revenues. Potential revenue sources are summarized in Section 7 and the complete financial plan element is included as Appendix A.

Once the LRP has been adopted, the CMPO must prepare an annual TIP that identifies specific projects to be implemented during the next three to five years. The TIP must be updated at least once every two years and include public review and public hearings. It must be financially constrained by year and include a financial plan which demonstrates that the projects can be implemented using the current and projected revenue sources.

Document Format

This report includes 10 sections and 13 Appendices that address federal LRP requirements. Section 8 provides the FCP and Section 9 provides the remaining or Unconstrained Project List (UPL). Section 10 contains information provided in the executive summary plus a list of the next steps in the planning and implementation process.

The Appendices include a wide variety of documents that support the body of this report. Five technical memorandums were prepared to document the specific processes and results of project selection and public involvement. These documents provide greater detail than this report and should be referenced to answer detailed questions. Three documents were prepared independent of this LRP. They include detailed information about future transportation needs related to transit, non-motorized transportation, and air travel. The Appendices also include a list of local government workshop participants, the CMPO public involvement policy, Corridor Preservation and Access Management overviews, and federal regulations applicable to the metropolitan planning process.

SECTION 1 - TRANSPORTATION PLANNING PROCESS

This section describes the purpose of a long range transportation plan and the planning process.

A. Purpose of the Long Range Plan

The purpose of the CMPO 2025 LRP is to plan for transportation system improvements in accordance with the federal planning requirements for MPOs. The Federal requirements state the following with respect to the transportation planning process:

> "The metropolitan transportation planning process shall include the development of a transportation plan addressing at least a twenty year planning horizon. The plan shall include both long-range and short-range strategies/actions that lead to the development of an integrated intermodal transportation system that facilitates the efficient movement of people and goods."
>
> Source: Section 450.322, Federal-Aid Policy Guide

The economic vitality and enriched lifestyle of communities depends upon people and goods reaching desired destinations. Through transportation planning, Cache County communities will benefit from a safer and more efficient transportation system through the year 2025. This LRP specifies a coordinated system of roadways, pedestrian/bicycle routes, intelligent transportation systems (ITS), and transit facilities and services. Only those transportation projects included in the multi-modal FCP are eligible to receive federal funding.

Transportation services and facilities must be planned to accommodate the needs and values of the community. The community impacts of this plan were identified through an analysis of environmental, land use, physical, and mobility/access implications of the chosen modes, facility designs, and the location of transportation infrastructure. The LRP development included continuous public involvement and direction.

B. Transportation Planning Process

This LRP is an update of the 1997 CMPO 2020 Long Range Transportation Plan.

1. Federal Planning Guidelines

The federal regulations for metropolitan transportation planning provide the planning process for development of metropolitan transportation plans (TEA-21 Guidelines, Appendix L). The transportation plan must be developed through a process which includes proactive public involvement and recognizes local community issues. The seven planning factors shown in Table 1-1 were considered in the project prioritization process presented in Section 6 of this Plan.

TEA-21 requires that a financial plan be part of the overall transportation plan to ensure that the recommended improvements included in the plan can be implemented with projected revenues. The Financial Plan Element of the LRP is included as Appendix A.

TABLE 1-1 TEA-21 PLANNING FACTORS

No.	PLANNING PROCESS FACTORS	FINANCIALLY CONSTRAINED PLAN	UNCONSTRAINED PROJECT LIST
1	Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency	* Reduce system-wide traffic delay * Separate truck routes * Clarify major site access points * Modal interfaces	* Low-cost transit system to access educational, industrial, and commercial centers.
2	Increase the safety and security of the transportation system for motorized and non-motorized users	* Access control crash reductions * Roadways with separate turn lanes * Roadways to accommodate bikes/pedestrians [1]	* Intersections - Identify signalization needs
3	Increase the accessibility and mobility options available to people and for freight	* More capacity on existing roads * New roads for capacity and access * Better connectivity between comm. * Extended truck route	* Completes region wide transportation needs
4	Protect and enhance the environment, promote energy conservation, and improve quality of life	* Identify planning level impacts * Conceptual road designs * Project identification based on mobility enhancement (reduce delay = better air quality)	* Completes region wide transportation needs
5	Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight	* Separate truck routes * Transit center [2] * Bike/transit capabilities [1,2]	* Completes region wide multi-modal transportation needs
6	Promote efficient system management and operation	* Identify problem areas and coordinate solutions * TSM projects	* ITS Applications
7	Emphasize the preservation of the existing transportation system	* Identify improvements in place * Access Management	* Maintenance * ITS Applications

Notes:

1 - The CMPO Long-Range Pedestrian/Bicycle Plan (1999) is included in Appendix F

2 - The Logan Urbanized Area Short Range Transit Study (1996) is included in Appendix E

2. State Planning Requirements

UDOT carries out the State of Utah's role in the metropolitan planning process. UDOT oversees distribution of federal funds from the Federal Highway Trust Fund for Utah and it also oversees the metropolitan planning process for the three urban regions in Utah. Their role is to participate in all planning processes outlined in TEA-21 and to ensure that the metropolitan planning mandates are met by urbanized areas.

3. CMPO Planning Process

As the designated urbanized area transportation planning authority, the CMPO must complete the LRP to ensure continued federal funding of transportation projects. This is a specific requirement of TEA-21.

The CMPO, in conjunction with the LTD and UDOT, is responsible for carrying out the metropolitan planning process. The LRP and any periodic updates must be approved by the CMPO Executive Council.

LRP development included outreach to representatives from the communities in the LUA along with representatives from state and federal agencies. The process included six workshops. Attendees at the workshops included the CMPO Executive Council, CMPO Technical Advisory Committee (CTAC), a representative of each entity's planning and zoning board, a representative of each entity's city/county council, and various staff from the member jurisdictions. The workshop group assisted the CMPO staff and the consultant team in making the necessary decisions throughout the planning process. Three public open houses and a public hearing were conducted to provide information concerning the process and to obtain verbal/written response from interested parties.

As part of the metropolitan planning process, the CMPO has adopted a policy for public involvement (Appendix H). The public meetings and workshops held during the development of the LRP exceeded the level of involvement established by the CMPO policy and federal law. In excess of 500 people attended the public meetings and more than 100 written comments were received.

All of the public comments and results of the numerous workshop sessions were incorporated into the first draft of the LRP, which was made available for review and comment prior to a public hearing held by the CMPO Executive Council. Comments from the public, CTAC, and the Executive Council, were incorporated into the Final Plan for review and adoption by the CMPO Executive Council.

Once the LRP is adopted, the CMPO must prepare an annual TIP that identifies specific projects to be completed during the next three to five years. The TIP must be financially constrained by year and include a financial plan which demonstrates that the projects can be implemented using the current and projected revenues. Development of the TIP must include public hearings on the projects proposed for inclusion.

SECTION 2 - DESCRIPTION OF CMPO

A. Cache Metropolitan Planning Organization

1. Mission

The CMPO provides coordinated transportation planning for the LUA in order to develop an intermodal transportation system that facilitates the efficient and economic movement of people and goods.

2. Goals and Objectives

The following Goals and Objectives have been developed to accomplish the stated Mission:

a. Enhance mobility within the urbanized area

(1) Efficient use of existing transportation systems.
(2) Improve capacity of the regional transportation system.
(3) Reduce traffic congestion within the region.
(4) Use access management to preserve roadway capacity.
(5) Meet the needs of citizens with disabilities and comply with the Americans with Disabilities Act (ADA).
(6) Preserve corridors for future capacity enhancements.
(7) Develop alternate modes of transportation:
    (a) Bikeways (designated bike paths, routes and lanes)
    (b) Expanded public transportation service

(c) Pedestrian system enhancements

(8) Minimize out-of-direction travel between origins and destinations.

(9) Identify and preserve major recreational travel corridors within the region.

b . Improve safety of the transportation system

(1) Use access management to minimize vehicular conflicts.

(2) Correct safety deficiencies.

(3) Minimize conflicts between motorized, non-motorized vehicles, and pedestrians.

c. Protect the environment

(1) Maintain air quality attainment status.

(2) Minimize impacts on established neighborhoods.

(3) Plan, design, and construct with sensitivity to the environment.

d. Coordinate among the member jurisdictions to provide a regional transportation system

(1) Provide opportunities for public involvement in the transportation planning process.

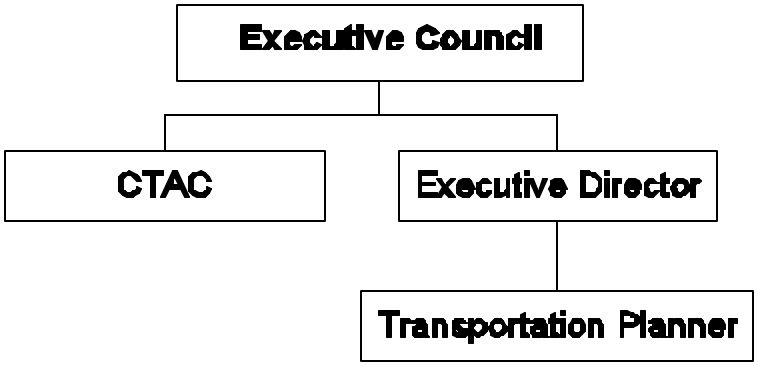
(2) Facilitate the planning process among member jurisdictions.

(3) Coordinate with Cache County and UDOT for areas outside the LUA.

3. Organizational Structure

The CMPO Executive Council is the governing and final decision-making body for the organization. It is comprised of the Mayors of each city in the LUA, the Cache County Executive, the LTD Director, a representative of the Utah Transportation Commission, and a designated member of the Logan City Council.

CMPO Organizational Structure



The CMPO Executive Council appoints an Executive Director to oversee the everyday operation of the CMPO, prepare the annual operations budget, and prepare the annual capital improvement program for the CMPO. The Executive Director supervises the full-time staff of the CMPO. Currently, the CMPO has one full-time Transportation Planner who conducts all administrative functions of the organization, manages the on-going metropolitan transportation planning process, and organizes the activities of the two standing committees.

The CTAC is responsible for advising the Executive Council on all urban transportation planning matters and to supervise the metropolitan

transportation planning process. Additionally, this committee advises on issues of a technical nature and provides recommendations on CMPO policy issues. The CTAC is comprised of engineers, planners, technicians, city/county full-time staff, staff of state and federal transportation agencies, and local elected/appointed officials (see list of CTAC participants in Appendix H). Because the committee is advisory in nature and serves as a forum for the discussion of transportation related technical issues, stringent membership and attendance rules are not in force. Local governments may appoint members, according to their needs, to attend when issues of interest are discussed.

B. Urban Area Characteristics

1. Boundary

The boundaries of the LUA and the study area for development of the LRP are shown in Figure 2-1 on the next page. The urbanized area extends from the south in Nibley to approximately 13 miles to the north in Smithfield, and west of Logan to the national forest boundaries on the east. Its boundary encompasses an area of approximately 75 square miles.

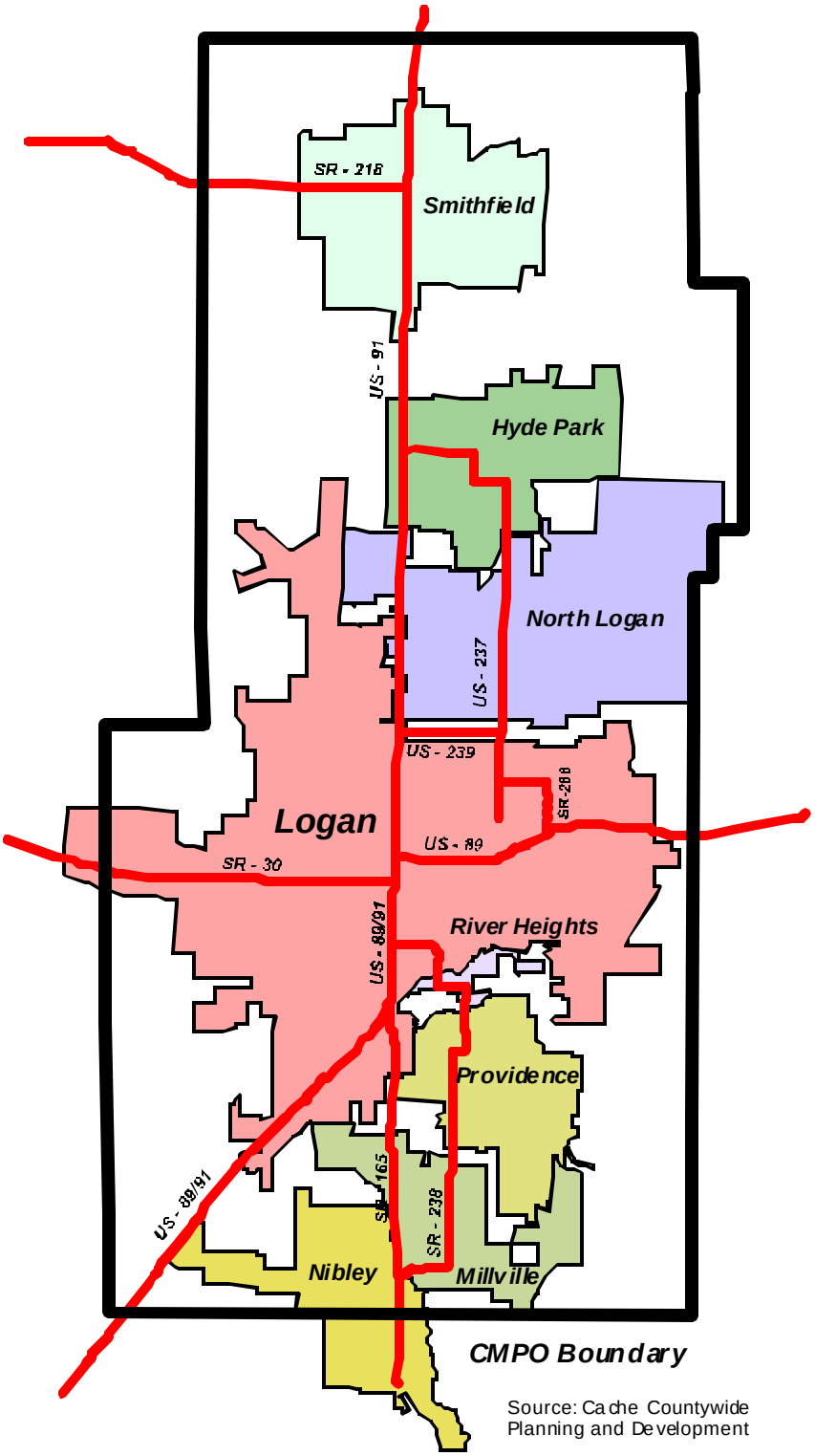


FIGURE 2-1 LOGAN URBANIZED AREA

2. Population Trends

In 1995, the LUA population was 63,542. The breakdown is as follows:

- 39,230 or 62% from the City of Logan
- 22,581 or 36% from other incorporated communities
- 1,731 or 2% from unincorporated communities.

The urbanized population is projected to experience rapid growth between 2000 and 2010. Average annual growth rate for the area has been 2% per year. Cache County has maintained this growth rate since the 1950 census and is expected to continue until the year 2025. It is important to understand that a continuing annual growth rate of 2% will have a doubling effect every 35 years.

3. Employment Trends

The largest employer in the LUA is Utah State University (USU) with over 5,000 employees. The second largest employer is Icon Health and Fitness with more than 2,000 employees at their Logan facility, and 800 at their Smithfield facility. As the major employer entities expand, the transportation system should expand to meet their needs.

The construction, transportation, and trade sectors will experience the greatest growth over the next 25 years. These sectors are expected to grow at 41, 41, and 31 % respectively. Growth rates were used to project employment for each of these sectors through 2025. This approach provides a more accurate projection than a single growth rate applied to total employment. As new houses are built, there will be a need for expanded

services and telecommunications/utility equipment to be installed throughout the County.

A large number of activity centers are located in the Central Business District (CBD) of Logan, not all of which are commercial establishments. There are a number of attractions throughout the LUA which draw people, including parks, schools, and medical facilities.

4. Generalized Land Use Trends

Land use trends are projected using population and employment data. From these trends, land use maps have been developed. These maps provide a fair estimation of the primary activities taking place within a Traffic Analysis Zone (TAZ). A TAZ is a geographical unit within a study area for which travel characteristics are collected and analyzed. A parcel by parcel land use survey provides detailed information of activities within a TAZ.

A comparison of employment and population densities provides a generalized land use for each TAZ. The TAZ with more population is likely to be mostly residential areas, while the TAZ with more employment will tend to be mostly commercial/industrial. The following sections discuss the generalized land use categories and their definitions and density ranges.

a. 1995

In 1995, there was only one high density area near USU campus and there were more than 15 people per acre. The majority of the residential dwelling units in the City of Logan had a medium density of 6 to 15 people per acre. In contrast, the west side of Logan and

areas along the NE Bench have low densities of 0.5 to 6 people per acre. See Figure 2-2 on the next page.

The communities of Smithfield, Hyde Park, North Logan, Providence, and Millville had low density residential land use patterns. The only additional land use pattern separate from residential occured within the City of North Logan. A strip of high and low density commercial development was located along Main Street.

The land use patterns for 1995 showed many vacant and open parcels of land. The City of Nibley had a sparsely settled land use pattern showing less than 0.5 people per acre. Hyde Park had similar open space lands scattered through-out the community.

b. 2025

Over the next 25 years, much of the residential, commercial, and industrial growth in Cache County is expected to occur within the LUA. The communities in the LUA can expect an overall increased density of the different land use patterns within each community as the open space is filled in. The pattern of high density residential land uses will increase primarily along the North-east Bench and near the USU campus. Other high density residential areas are expected to develop near 1400 North and 600 West. This area has a large number of multi-family dwellings with new dwellings expected through 2025. The other high residential density is expected to occur in the Island area and in the Historic District of Logan. Both of these areas are expected to have large numbers of young families moving into them, thereby increasing density. The remaining portions

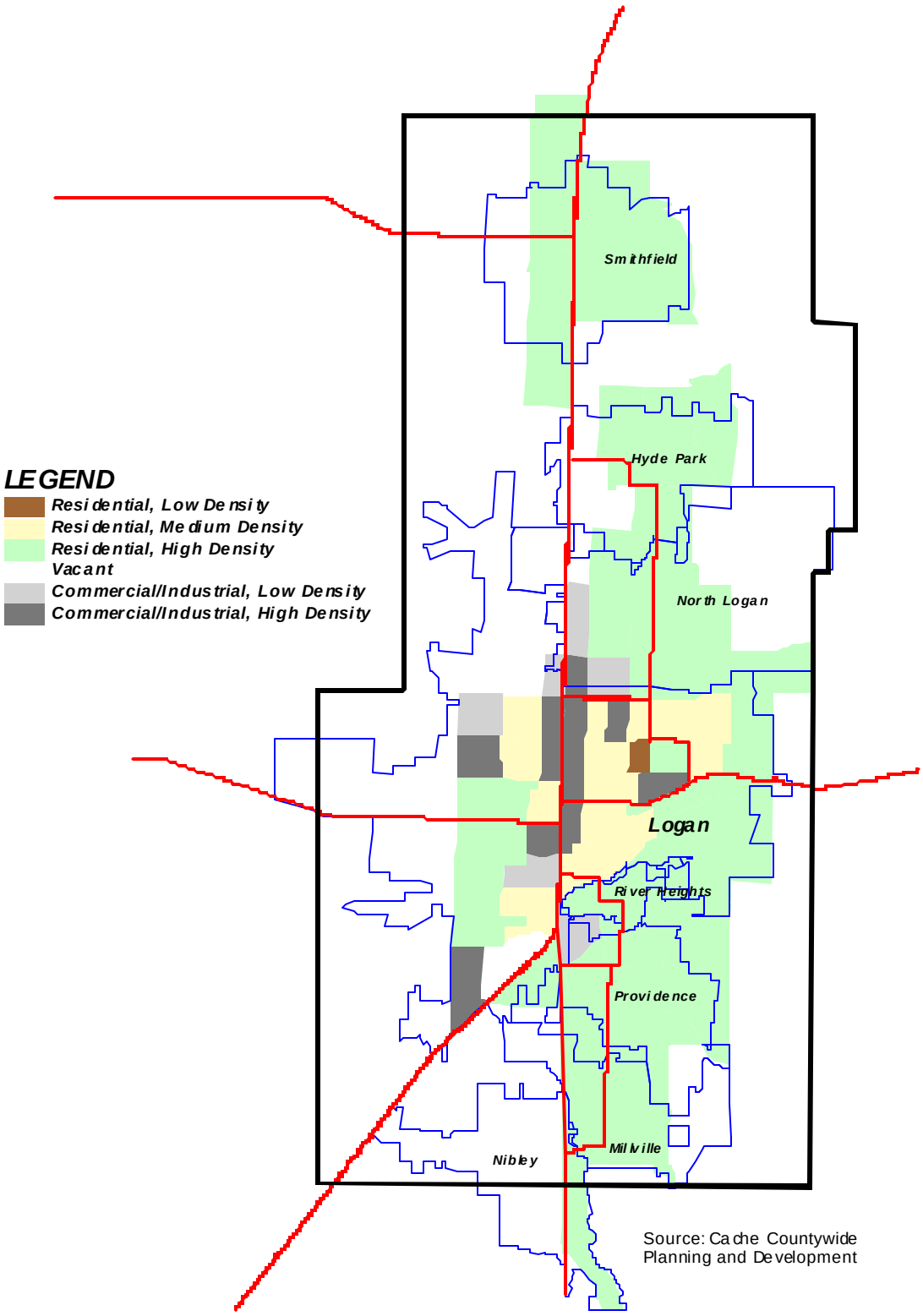


FIGURE 2-1 1995 POPULATION DENSITY

of Logan are expected to have residential areas with medium densities. See Figure 2-3 on the next page.

The other communities within the urbanized area are predicted to have low density residential areas. However, one exception is the City of North Logan, which will have medium density pockets throughout the community. The City of Nibley is installing a sewer system within their community. This improvement will provide the ability for pockets of higher density development over the next 25 years. However, the community will still maintain fairly low overall residential density.

As the communities of the LUA continue to develop, many neighborhood communities will begin developing higher density areas to meet the housing needs for new first time homeowners. These new residents will place added pressure on the local road network. Therefore, the current transportation system will need to be expanded to meet demand from higher density residential neighborhoods.

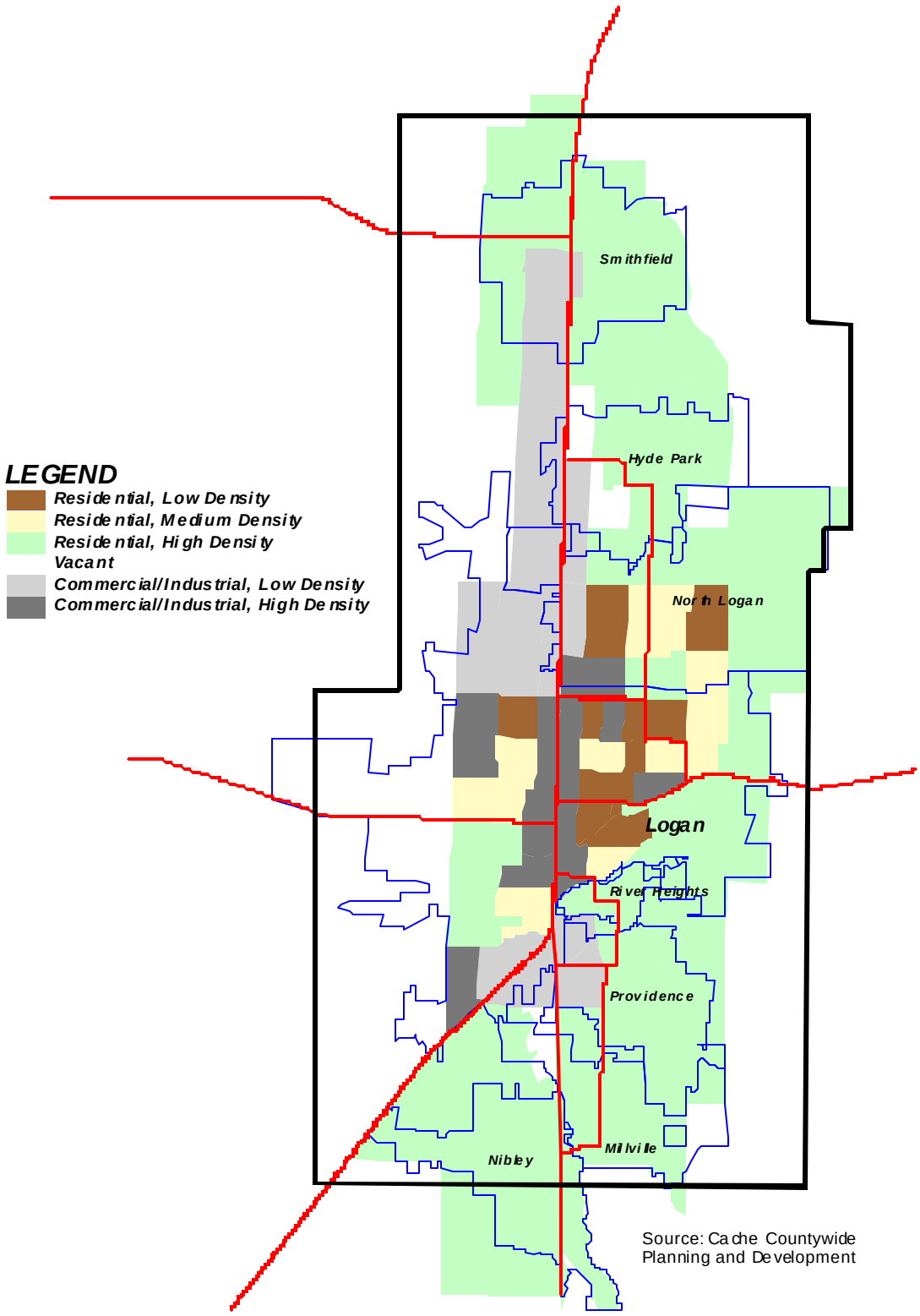


FIGURE 2-1 2025 POPULATION DENSITY

SECTION 3 - TRANSPORTATION SYSTEMS

A. Roadway System

1. Existing

The existing roadway transportation system in the LUA is a grid system. The blocks within the system are mostly uniform and measure approximately 660 feet between intersection centers. There are no restricted-access highways or freeways in the LUA. Streets are categorized by their use and function in the overall street system. Table 3-1 provides a general description of the functional road classifications and Figure 3-1 is a representation of the roadway functional classifications in the LUA. Congestion is experienced daily along Main Street (US 91) and the major east-west corridor roads.

TABLE 3-1 DESCRIPTION OF ROADWAY FUNCTIONAL CLASSIFICATIONS

FUNCTIONAL CLASSIFICATION	DESCRIPTION
Principal Arterial	Provides a network connecting vehicles and transit to other principal arterials, major collector streets, and to the freeway system. It also provides access to abutting commercial and industrial property. It carries moderate-to-heavy vehicular movement, low-to-high pedestrian and bicycle movements, and moderate-to-high transit movements. It has 4 to 6 travel lanes (typically with a raised center median), street trees, street lighting, and sidewalks, overhead or underground utilities, and/or wide curb lanes (bicycle lanes)
Minor Arterial	Similar to a Principal Arterial except that it may have 4 travel lanes with a two-way-left-turn lane
Major Collector	Primarily provides connection between Minor Arterial and other collector streets and streets of higher classifications and secondarily provides access to abutting property. It carries low-to-moderate vehicular movement, low-to- heavy pedestrian movement, moderate-to-heavy bicycle movement, and low-to-moderate transit movement. It has street trees, street lighting, and sidewalks. It may also include landscaping, pedestrian-scale lighting, and overhead or underground utilities
Local Street	Primarily provides direct access to abutting property. It carries low vehicular movement, low-to-heavy pedestrian movement, and low-to-moderate bicycle movement. It has on-street parking, street trees, street lighting, and sidewalks. It may include landscaping, pedestrian-scale lighting, and overhead or underground utilities

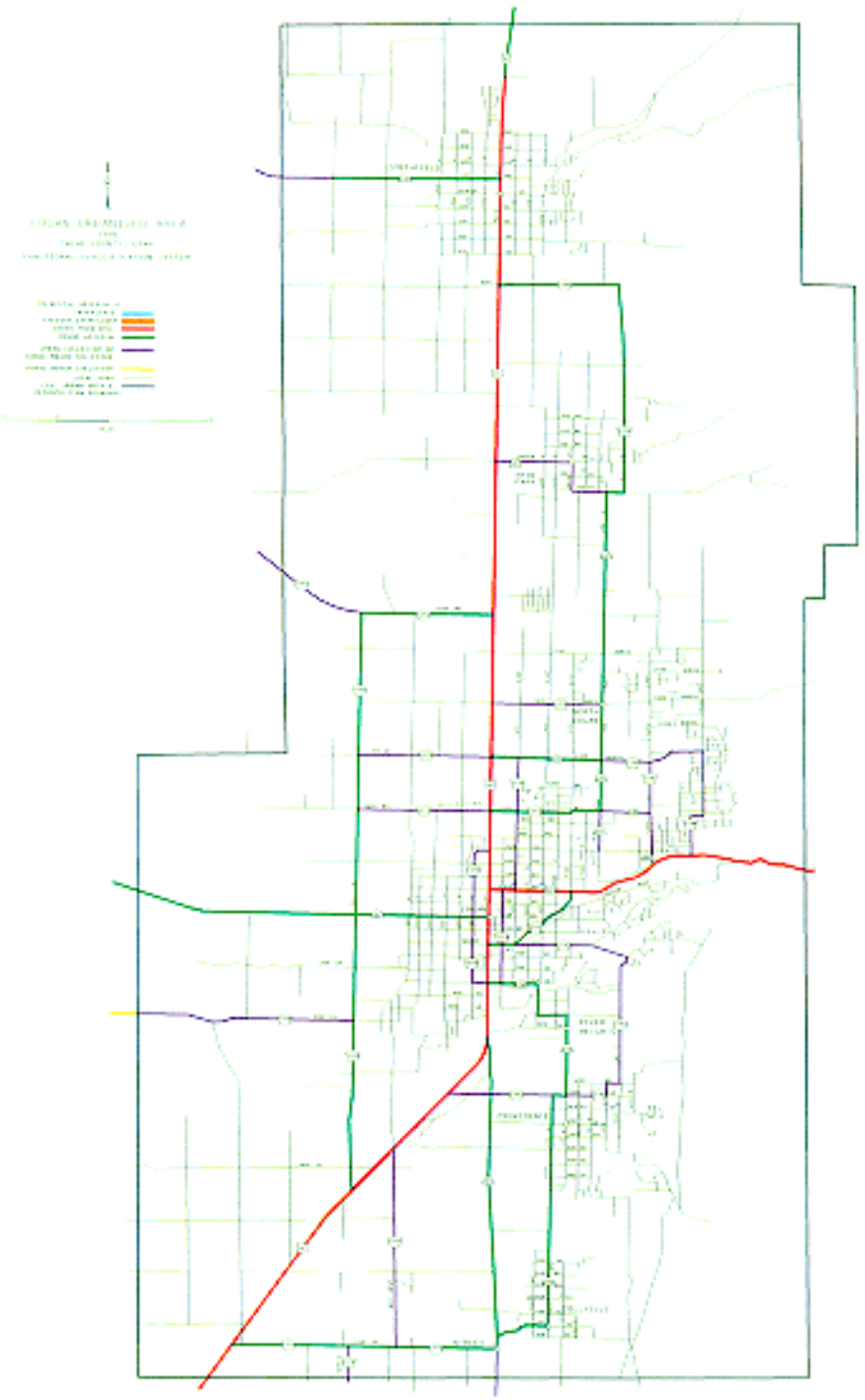


FIGURE 3-1 ROADWAY FUNCTIONAL CLASSIFICATIONS

2. Road Ownership

Road ownership in the LUA depends on the road's jurisdictional location and operational function. Table 3-2 shows the three different ownership classes:

TABLE 3-2 ROAD OWNERSHIP CLASSIFICATION

CLASS	OWNERSHIP
A	Constructed, maintained, and under the jurisdiction and control of UDOT. Includes State routes, highways, and principal arterials
B	Unincorporated area roads under the jurisdiction and control of Cache County. Includes minor arterials and major collectors
C	Incorporated area roads under the jurisdiction of the respective municipalities. Includes collectors and local streets

Source: Cache County

3. LRP Road Selection

The primary function of new or improved road facilities in this LRP is to enhance the mobility of the region and reduce the expected congestion that will occur over the next 25 years. In determining the benefit and cost of improvements to the transportation system, it was necessary to develop typical cross-sections for new or improved roads. These standards dealt with number of travel lanes, center turn lanes, and off-road items (curb and gutter, sidewalk, and grass park strip). Specific road cross-section assumptions are given in Appendix D of Technical Memorandum #4. The design assumptions of this planning effort provided consistent and comparative information for the project ranking process.

When a project moves to the design phase, the design should be based on the typical sections that were evaluated in the LRP. This approach will

assure that the project will mitigate congestion as planned. During the design phase, projects should be viewed on the following conditions: change in residential character or residential disturbance, new road construction in undeveloped areas, pedestrian amenities, and capacity improvements.

4. CMPO Guidelines

The responsibility of the CMPO is to plan for and program federal funds for improving or building collector and higher classification roads. As part of this LRP development, it was determined that federally funded road projects should reduce congestion on US 91 and to the overall transportation system. With these two points in mind, the CMPO established the following guidelines for the development and design of CMPO funded road projects:

a. The goal of proposed road projects is to increase mobility in the LUA and relieve present and future road congestion.
b. The cross-sections shown in Figures 3-2 thru 3-4 are guidelines; flexibility is allowed through combination of minimum standards.
c. In undeveloped areas where the proper right-of-way (ROW) can be obtained, the CMPO ROW standards should be followed.
d. Cross-section standards can be adjusted in areas with established residential fronting, access control, established commercial ROW constraints, and other conditions.
e. Projects brought to the CTAC should be reviewed for their unique conditions and constraints before being programmed in the TIP. The unique conditions and constraints should be the basis for design exceptions to standard cross sections.
f. The project sponsor needs to demonstrate that any deviations from the standard cross-sections still meet the “purpose and need” of the

project and address accepted safety considerations..

g. Enhancements for pedestrians (sidewalks, crosswalks, etc.) should be considered wherever pedestrian traffic is permitted. Enhancements for bicyclists (wide curb lanes) should be considered wherever bicycle traffic is permitted. Enhancements for transits users should also be considered for each project. The 1999 CMPO Long Range Pedestrian/Bicycle Plan (Appendix F) and neighborhood groups should be consulted during the design process of such projects.

h. Projects using federal funds often need to meet UDOT standards which are mostly associated with multi-lane highways that carry cars and freight. Most of the projects proposed in this plan may not meet the freight design standards. Design exceptions should be considered, where appropriate.

5. Standard Cross Sections

A standard roadway cross section provides geometric standards by which a community will develop the roadway system. These cross sections act as the basic guidelines for roadways in undeveloped areas. However, these cross sections may not always provide the perfect fit in developed areas, which require more flexibility with geometric standards. These standard cross sections may not apply at intersections where additional width might be needed to accommodate turning lanes. A local government project sponsor should conduct a detailed traffic analysis to develop design options for specific projects.

The roadway cross-sections shown on the next three pages indicate the geometry of the CMPO's adopted standards.

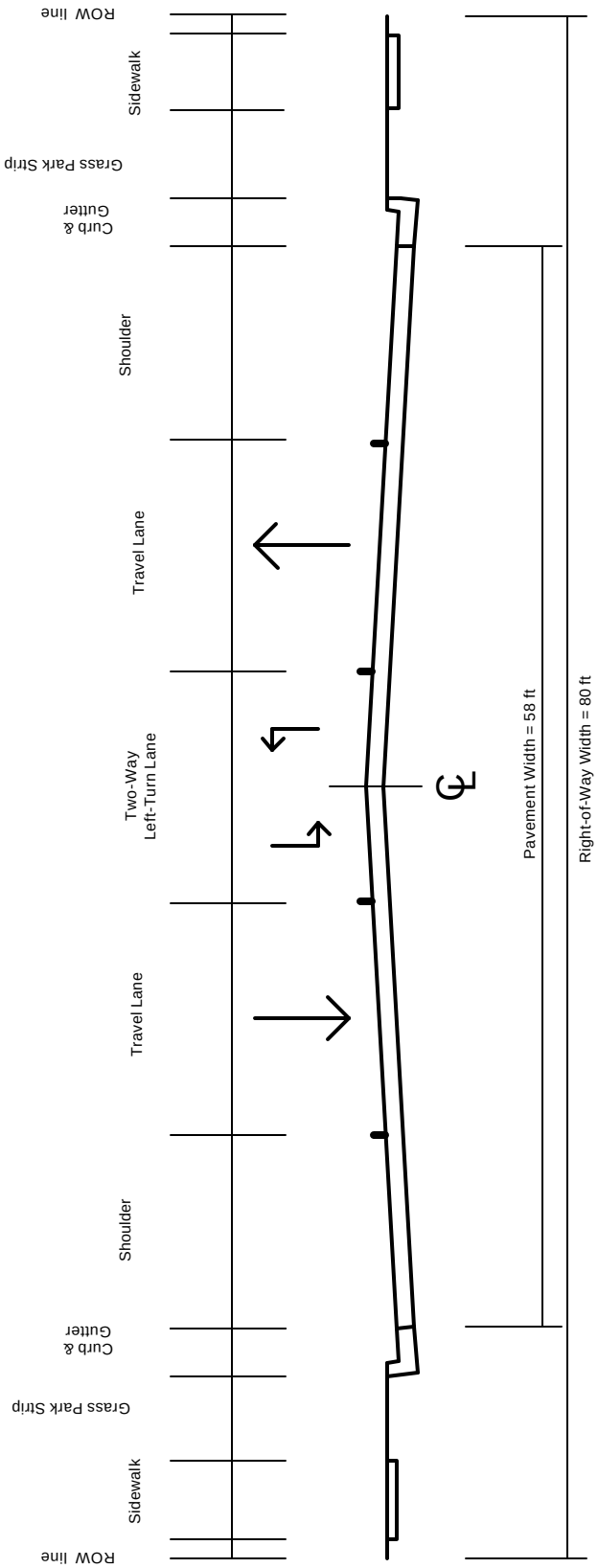


FIGURE 3-2 COLLECTOR DIAGRAM

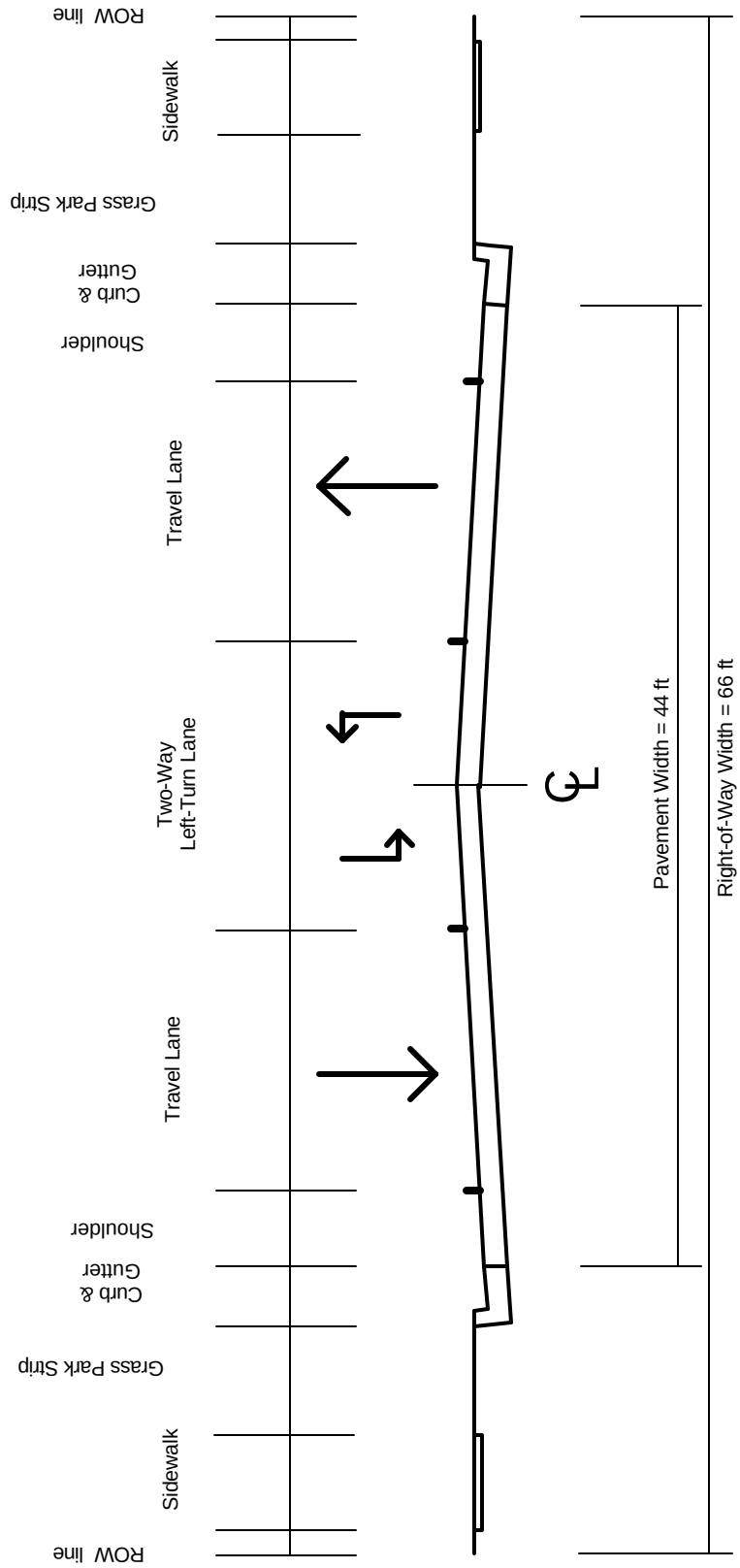


FIGURE 3-3 ALTERNATIVE COLLECTOR DIAGRAM

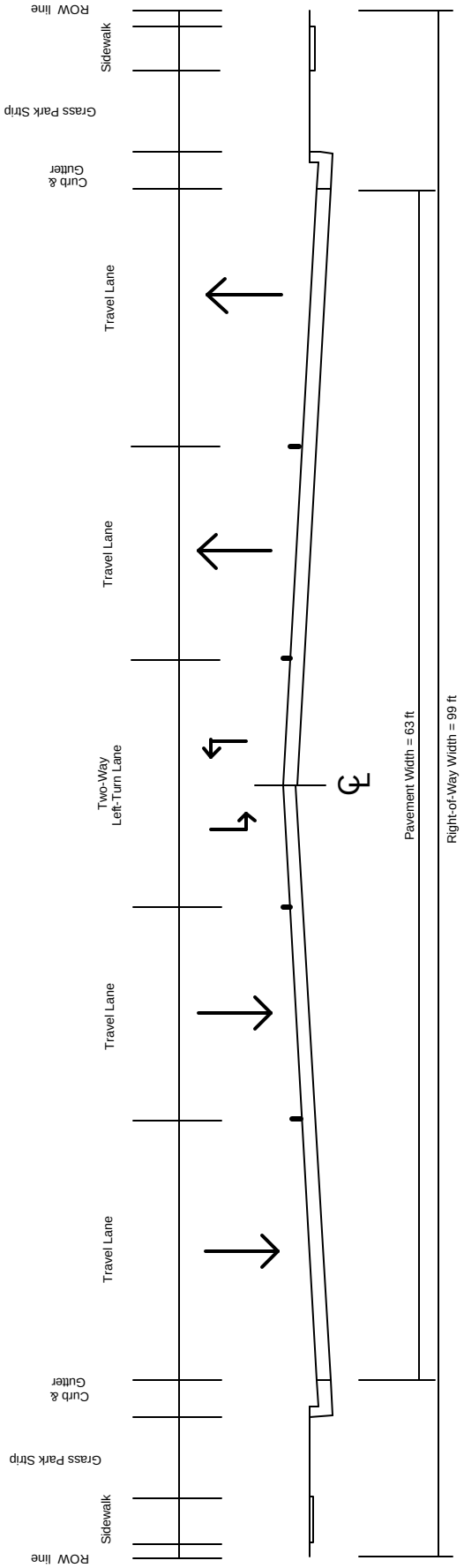


FIGURE 3-4 MINOR ARTERIAL DIAGRAM

Table 3-3 provides design standards that project sponsors can use to prepare concept reports for road projects that are part of the FCP (refer to Section 8).

TABLE 3-3 DESIGN STANDARDS

Option or Element	Standard
80 feet ROW Option Collector	preferred option, two travel lanes, and a two-way left turn lane, with shoulder. 58 feet pavement width
66 feet ROW Option Alternate Collector	used in specific circumstances where 80 feet option is not viable, two travel lanes, a two-way left turn lane, a 3 feet shoulder, and no parking. 44 feet pavement width
99 feet ROW Option	Minor Arterial, up to 4 travel lanes and a two-way left turn lane. 63 feet pavement width
Travel Lane	12 to 14 feet (see "Wide Curb Lane" also)
Two-way Left-Turn Lane	14 feet for segments. Intersections vary: (12 feet for single left and 14 feet for dual left turns)
Sidewalk	5 feet minimum
Curb and Gutter	2.5 feet
Parking Lane	10 feet minimum, depending on ROW, could allow parking on both sides of road way, one side, or ban parking totally.
Wide Curb Lane	14-15 feet, designated as a bicycle/motor vehicle shared lane, all outside lanes should be wide enough to be a wide curb lane
Shoulder	10 feet desirable, 3 feet minimum (not including gutter pan)
Grass Park Strip	3 feet minimum
Intersections	Should occur at ninety degree angles, provide proper sight distance, and have ADA standard sidewalk cuts. Lane requirements should be based on traffic analysis.

B. Transit System

The LTD began fare-free traditional fixed-route and paratransit services on April 27, 1992. Service is provided Monday through Friday from 6:15 AM to 9:45 PM, and

Saturdays from 9:15 AM to 6:45 PM. Fixed-route service is characterized by 30-minute intervals within ¼ mile of all major activity centers and housing developments within Logan. This service is funded primarily through a 0.25% sales and user tax, which is supplemented with FTA formula funds.

The Logan Urbanized Area Short-Range Transit Plan (1996) (Appendix E) includes a detailed analysis of the increased transit service needs within Logan and for expanded service outside of Logan into Cache Valley. Service within Logan will be increased during peak periods to provide more frequent service. Over the next 25 years, service will be expanded to serve new areas of Logan as needed based on the demand for public transportation. The CMPO is planning service throughout (and adjacent to) the LUA through institution of the Cache Valley Transit District (CVTD). See Appendix E for more detail.

USU also operates an on-campus shuttle system that serves people parking at remote lots. This service is not discussed at length in the Short-Range Transit Plan, but CVTD will probably serve the campus. Numerous non-profit and specialized transportation service providers are discussed in the Short-Range Transit Plan.

The CMPO and LTD are planning to update the Short-Range Transit Plan in fiscal year 2001.

C. Non-Motorized Transportation System

The CMPO's goal for the non-motorized transportation system is to increase Pedestrian and Bicycling use, safety, and efficiency. The CMPO Long Range Pedestrian/Bicycle Plan (1999) (see Appendix F), is intended to help the LUA accomplish this goal. Refer to pages 5 thru 11 of the Pedestrian and Bicycle Plan for a description of existing and planned pedestrian and bicycle facilities.

SECTION 4 - ROADWAY AND TRANSIT NEEDS ANALYSIS

A. Roadway

1. Existing and Projected Traffic Volumes

Pneumatic Tube Traffic counters are the most common method to inventory existing traffic volumes. They sense vehicles that drive over them. The traffic volume data used in this analysis was gathered from tube counters at selected locations and from UDOT's traffic volume data. Table 4-1 shows existing and projected traffic volumes.

TABLE 4-1 ESTIMATED AND PROJECTED AVERAGE DAILY TRAFFIC VOLUMES

Roadway	Location	1995	2020 (projected) "No Build"
State Roads			
US-91	South of Logan Downtown Logan (Main Street) North Logan/Hyde Park Smithfield (Main Street) North of Smithfield	18,900 26,100 20,500 19,800 14,200	32,000 40,500 28,400 30,400 22,300
US-89 (400 North)	Downtown Logan Logan Canyon	15,400 3,900	27,100 4,800
SR-30(200 North)	West of Logan Downtown Logan, west of Main St	10,400 9,600	17,000 15,200
SR-165	South of Millville Providence	16,000 17,300	24,700 24,800
SR-217 (2500 North)	West of US-91	3,200	6,700
SR-218 (100 North)	West of Smithfield Smithfield, west of Main St	2,700 1,500	3,900 2,200
SR-238	Millville (Main St) Providence (200 West)	1,700 4,300	3,100 7,000
Local East - West Roads			
3200 South	Between US-91/SR-165 (Nibley)	700	1,300
100 North	East of SR-165 (Providence)	2,600	3,600
Center Street	East of Main Street (Logan)	5,700	7,100
1000 North	West of Main Street (Logan) East of Main Street (Logan)	9,900 4,900	15,800 7,800
1400 North	West of Main Street (Logan) East of Main Street (Logan)	6,600 12,000	11,900 22,700
3700 North	East of Main Street (Hyde Park)	700	1,000
600 South	East of Main Street (Smithfield)	2,700	5,200

Roadway	Location	1995	2020 (projected) "No Build"
Local North - South Roads			
1000 West	South of 200 North (Logan) North of 200 North (Logan)	1,800 6,700	7,100 15,500
600 West	South of 200 North (Logan) North of 200 North (Logan)	2,600 4,200	4,900 6,800
100 West	South of 400 North (Logan) North of 400 North (Logan)	6,800 7,400	11,500 12,800
100 East	South of 400 North (Logan) North of 400 North (Logan)	11,300 8,100	17,900 11,800
200 East	South of 400 North (Logan) North of 400 North (Logan)	4,900 5,900	11,300 8,500
600 East	North of 400 North (Logan)	10,300	13,300
800 East	North of 700 North (Logan) North Logan	6,700 10,700	11,400 18,400
1200 East	North of 400 North (Logan) North Logan	6,600 1,700	11,900 3,300

2. Existing and Projected Levels of Service

Intersection and roadway segment level of service (LOS) is a standard used to describe traffic operating conditions and motorists perception of delay within a transportation system. This is an assessment of the combined effects of volume to capacity (V/C) ratios, speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. There are six LOS values. LOS A indicates the best condition and LOS F describes the most congested condition. Each community can set a minimum LOS standard for roadway operations. This is typically LOS "C" in rural areas and LOS "D" in urban areas. Table 4-2 shows detailed LOS definitions.

TABLE 4-2 LEVEL OF SERVICE DEFINITIONS

Level of Service	Definition
A	Describes operations with very low delay. This level of service occurs when there is no conflicting traffic.
B	Describes operations with moderately low delay. This level generally occurs with a small amount of conflicting traffic causing higher levels of average delay.
C	Describes operations with average delays. These higher delays may result from a moderate amount of minor street traffic. Queues or "back-ups" begin to get longer but are generally accepted as normal by most drivers.
D	Describes a crowded operation, with delays higher than average. At level D, the influence of congestion becomes more noticeable. Longer delays may result from shorter gaps in mainline traffic and an increase of minor street traffic. The queues of vehicles increase.
E	Describes operations at or near capacity of the road.
F	Describes operations that are at the failure point. This level, considered to be unacceptable to most drivers, often occurs when actual traffic volumes exceed the capacity of the road or intersection.

Figure 4-1 shows roadway LOS for 1995 and Figure 4-2 shows projected roadway LOS for 2025. The "no-build" scenario assumes that no transportation system improvements occur during the next 25 years.

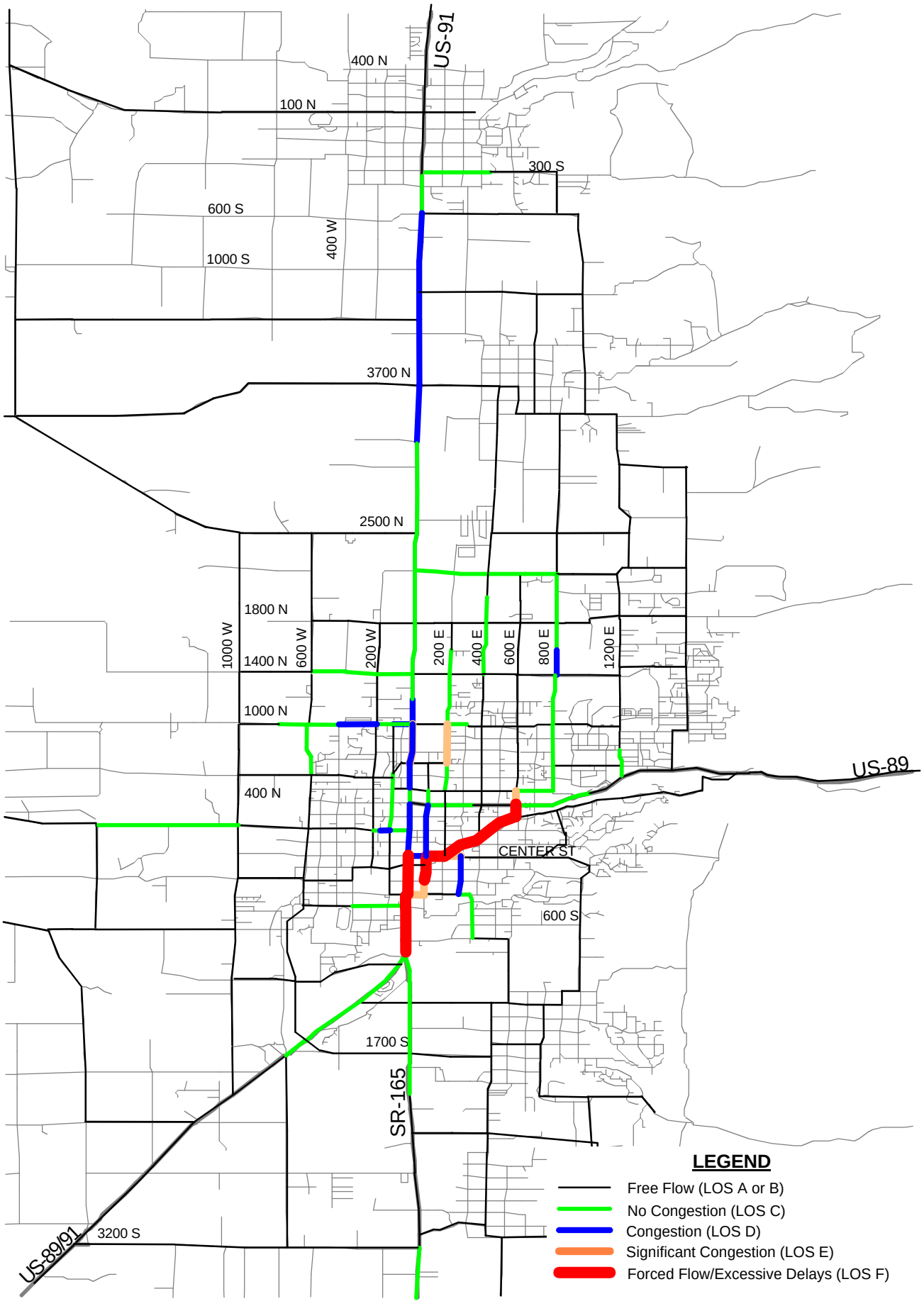


FIGURE 4-1

YEAR 1995 CONGESTION MAP

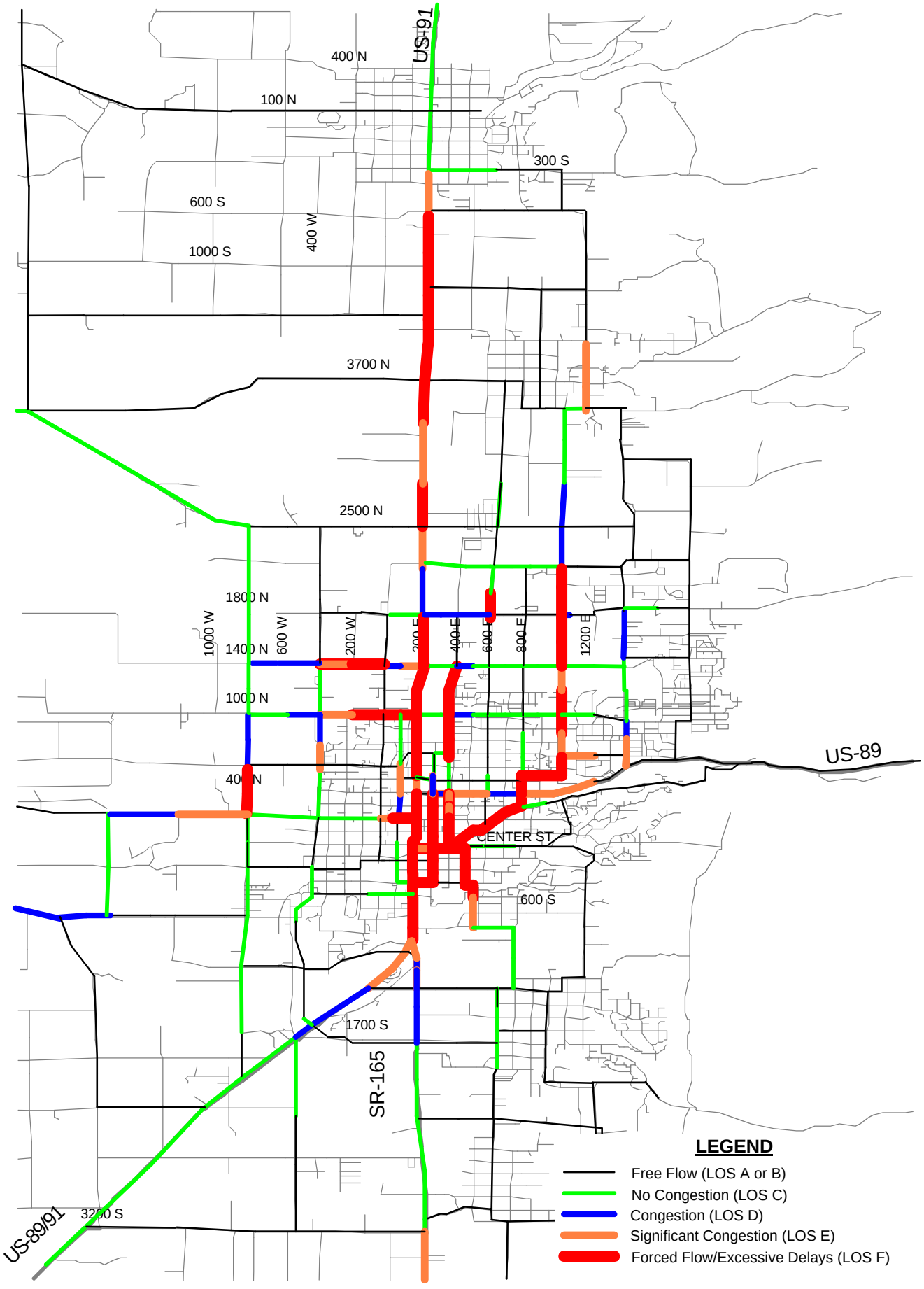


FIGURE 4-2

YEAR 2025 CONGESTION MAP
"NO BUILD" ALTERNATIVE

3. Purpose and Need for Roadway Projects

Figure 4-2 shows the degree of the future roadway congestion in the LUA, assuming no additional roadway improvement projects are constructed. The purpose of the LRP is to minimize the amount of roadways that experience unacceptable levels of service. Each of the projects listed in the LRP are needed to mitigate part of the overall congestion. Some projects can reduce congestion on the facility where improvements are made. Some projects provide new or improved links within the community and are able to reduce system-wide congestion.

B. Transit

The Logan Urbanized Area Short-Range Transit Plan (1996) (Appendix E) addresses transit needs throughout the LUA. The planned CVTD will be added to provide traditional fixed-route and paratransit service from Hyrum in the south to Richmond in the north. Although Richmond and Hyrum are outside the LUA, the vast majority of the transit service will occur within it and therefore the CVTD is incorporated in this LRP. Transit service focuses on current and projected commuter transportation demand. Travel demand relief will be reflected on the principal north-south corridors. Off-peak service will continue to be provided to accommodate transportation to medical and shopping facilities.

The projected costs for operations and capital equipment were developed as part of the Logan Urbanized Area Short-Range Transit Plan (1996). These costs were updated as part of this LRP. The total projected capital cost for replacement and expansion vehicles is $22 million over the next 20 years. The estimated operating costs for these services are $72 million.

1. Existing and Projected Ridership

Annual LTD ridership for fiscal year 1999 (July 1, 1998 through June 30, 1999) was 1,002,305 passengers on the fixed-route service and 14,153 on the paratransit service.

A five year ridership projection was made as part of the Logan Urbanized Area Short-Range Transit Plan (1996). A total of 260,950 additional passenger are expected to ride on the CVTD buses (132,800 commuter routes and 128,150 on North Logan local routes).

A 1% annual ridership growth can be anticipated through the year 2025 which results in an approximate 1.3 million riders for LTD and 338,000 for CVTD.

2. Basis for System Expansion Plans

Refer to Chapter 5 and Chapter 9 of the Logan Urbanized Area Short-Range Transit Plan (1996) for service alternatives and transit plans.

SECTION 5 - OTHER INTER-MODAL NEEDS

A. Air Transportation

The Logan-Cache Airport services Cache and Rich Counties and portions of Box Elder County in Utah. It also serves portions of Franklin and Bear Lake Counties in Idaho. Its primary operations are categorized as follows:

1. USU Flight training program
2. Business aircraft
3. Private aircraft

The growth of the airport (from 57 aircraft in 1990 to a projected 127 in 2016) has been accounted for in planning for the future. An Airport Expansion Plan has recently been completed (refer to Appendix G for excerpts from this plan) to accommodate existing and future growth. The Airport Plan includes the proposed extension of the runway (to be located within the unincorporated area of the county) to accommodate larger and faster aircraft.

B. Truck Freight

The CMPO is responsible for planning the uninterrupted passage of freight within and through the region. The major roadway facilities with truck freight traffic include 1000 West, US-89, US-91, SR-30, and SR-165. These facilities are included in the Model and are addressed in the LRP congestion management activities.

C. Rail Transportation

Rail transportation provides for intercity movement of freight in the LUA. All railroads in the region are owned and operated by private companies, therefore

planning for rail transportation by public agencies is limited. UDOT, however, has prepared a Utah State Rail Plan to inventory rail facilities in the state to identify existing problems and recommend new rail lines that are needed.

D. Commuter Rail

Because of the population density, the cost of commuter rail, and the distance to other urban areas, commuter rail has not been considered a viable alternative for intercity or intra-city travel within the LUA over the next 25 years. There is currently a movement to consider a commuter rail line between the Provo-Orem area and Brigham City. It would be beneficial for this study to consider a commuter rail extension to the LUA.

E. Travel Demand Management

There are many travel demand management techniques that are being or could be employed throughout the LUA. These include, but are not limited to carpooling, use of park and ride lots, flexible work hours, and telecommuting. Encouraging and promoting travel demand management techniques could enhance the efforts of the CMPO in reducing future traffic congestion.

Carpooling is an important means of travel for workers traveling to their place of employment. Approximately 3,506 individuals that live in the LUA are using carpooling. The use of Park and Ride lots play a major part of carpooling. Currently there are two park and ride lots that serve the urban area. One lot is located on US-89/91 in Wellsville south of the urban area and the other is located on SR-30 and approximately 1200 West, west of the City of Logan. There is a park and ride lot being considered north of the LUA on US 91. The CMPO should encourage UDOT to construct this facility. Another possible opportunity is to form agreements with the Church of Jesus Christ of Latter-Day Saints and other private or public facilities with large parking facilities that go largely unused during weekdays.

A long range transit project is to extend services outside of the City of Logan, but this will still not meet commuter demand. One way to address this demand is through vanpooling. Under a vanpool program, the sponsoring agency provides public vehicles and identifies persons interested in carpooling. Fuel and maintenance are provided by the sponsoring agency, or contracted with a local garage. Costs associated with the vanpool are used to identify a monthly per-passenger fee. Vanpooling has great benefits in encouraging multiple passenger trips, but can be very capital intensive and administratively burdensome.

A Texas Transportation Institute study found telecommuting programs resulted in cost savings from reduced office space needs, demand for parking spaces, and employee absenteeism. In addition, offering telecommuting options has helped companies and agencies attract and keep skilled professionals. Telecommuting reduces the number of vehicles on the road during peak-periods. As a result, it can help manage traffic congestion, improve air quality levels, and decrease energy consumption. The Texas study supports the finding at the national level that telecommuting reduces peak-period trips, and telecommuters' non-work trips do not increase significantly (Potential of Telecommuting for Travel Demand Management, Texas Transportation Institute, Fall 1996).

F. Non-Motorized Transportation

The 1999 CMPO Long Range Pedestrian and Bicycle Plan (Appendix F - pages 12 thru 16), describes the analysis process that helped determine the pedestrian and bicycle needs in the LUA. The needs analysis consisted of public involvement and demographic statistics by which several pedestrian/bicycle projects were identified.

SECTION 6 - ROADWAY PROJECT EVALUATION AND SELECTION

Public involvement and local government coordination occurred throughout the project evaluation and selection process. This process is described starting in sub-section "C".

A. Public Involvement

The goal of the CMPO's Public Involvement Process (Appendix H) is to provide early, active, responsive, and on-going public involvement. Four public information meetings and a public hearing took place during the development of this LRP. Individuals that provided their names and addresses at public meetings were mailed meeting notices, informational packages, and project fact sheets. Public mail-outs, newspaper notices, and Internet information were also part of the outreach effort.

As a result of comments and concerns expressed by the public, additional work was performed during the project evaluation and selection process. The following is a list of additional work:

1. Additional Project Alternatives Modeled and Evaluated:

- East Bench Bypass from River Heights to US Hwy. 89.
  This alternative provided moderate mobility benefits, but was expensive due to geologic and geographic constraints. It was dropped from further consideration due to its low benefit/cost ratio and its high environmental and socio-economic impacts.
- Logan's 100 E/100 W One-way Couplet from 400 S to 700 N.
  This alternative provided little mobility benefit even though it was relatively inexpensive. It was dropped from further consideration due

to its low benefit/cost ratio.

- No-build, Transit -only, and Land-use.
  These alternatives were discussed but later dropped from further consideration due to inconsistency with the objective of the LRP.
- Dugway Replacement from 400 E/Center Street to 400 N/600 E.
  For evaluation purposes, this segment was considered as a separate project from the 400 E project. It ranked high due to its high mobility benefits and benefit/cost ratio.
- 100 E from 100 N (Providence) to 400 N (Logan).
  This alternative was analyzed as a single project. It remained viable due to its high benefits in reducing Main Street congestion.

2. Additional Modeling Scenarios

The Top 10 projects were modeled separately and jointly as described below:

- Six of the Top 10 project alternatives were modeled independently from one another. The four Main Street TSM projects were not modeled independently.
- All Top 10 projects were modeled together to visually demonstrate decrease in traffic congestion.
- All proposed funded projects were modeled together to visually compare benefits and remaining congestion to be mitigated
- All TSM projects were modeled together to visually show congestion reduction benefits.

3. Additional Public Meeting

One additional public information meeting was held. Local agencies also held independent public meetings to discuss specific jurisdictional projects.

4. Project Sponsorship

A poll of Cache County and LUA cities was conducted to determine project funding (local government funding match) and political support.

Public participation played an important role in the project evaluation and selection process. Although the additional work requested by the public resulted in a delay of the project schedule, it provided the project team with insight on certain issues not previously considered.

Meeting summaries of all public meetings are contained in Technical Memorandum #4 (Appendix D). Meeting information and summaries were posted on the CMPO's web page.

B. Local Government Coordination

Federal regulations require that adequate opportunity is given to public officials (including elected officials) and citizens to participate in the development of the LRP. Public officials and the public had effective involvement and participation during the early stages and throughout the LRP development process.

Local government representatives were informed and involved in the project evaluation and selection process by participating in six workshops. Those attending the workshops included the CMPO Executive Council, CTAC, representatives from the cities and county, and various staff members from the CMPO member agencies. Refer to Appendix H for a listing of workshop participants.

Local government representatives participated in the following events:

1. Review of (122) Long List of candidate projects. Workshop #1-May 17, 1999

2. Selection of (40) Reduced List of candidate projects. Workshop #1-May 17, 1999
3. Approval of (25) Short List of candidate projects. Workshop #2-June 7, 1999
4. Determination of project Evaluation Criteria. Workshop #3-July 12, 1999
5. Review of Ranked Short List of candidate projects based on Evaluation Criteria. Workshop #4-August 31, 1999
6. Approval of Top 10 project list (technical recommendations). Workshop #5-January 10, 2000
7. Screening of Top 10 projects to determine proposed projects to be funded (see Section 8, Financially Constrained Plan for Roadway Projects). Workshop #5-January 10, 2000
8. Response to project sponsorship survey to determine financial and political project support. From September to November, 1999
9. Provide review comments for Draft LRP Document. Workshop #6-April 3, 2000

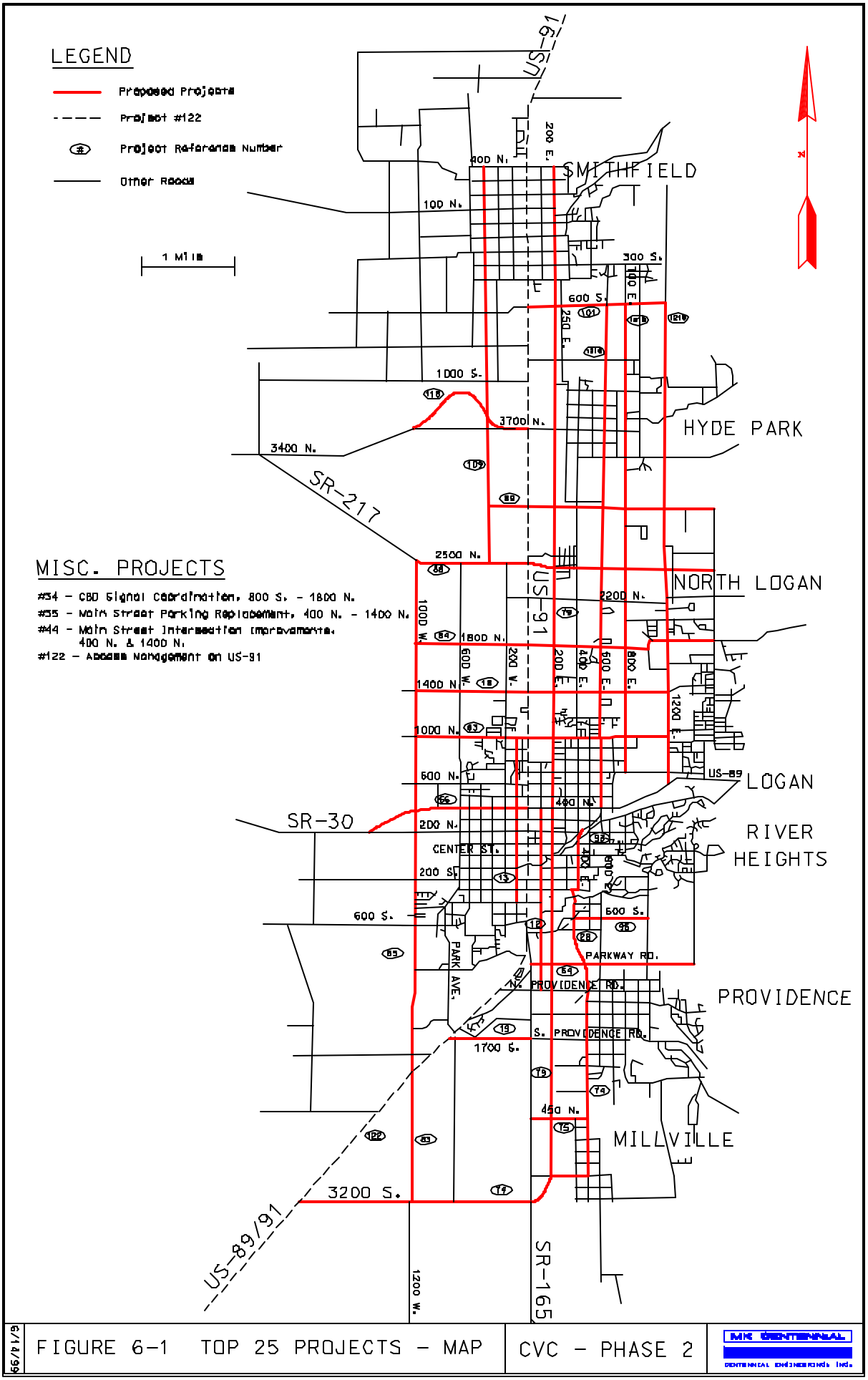
Technical Memorandum #4 and #5 (Appendix D and M, respectively), contain the meeting summaries of workshops held specially for public officials.

C. Candidate Project Selection

Sub-sections C - F provide a description of the project evaluation and selection process.

1. Project Identification

A list of 122 candidate projects was initially developed based on the regional mobility problems for existing and future conditions and high crash locations. This list was reduced to 40 projects and then to 25 projects. These 25 projects are shown in Figure 6-1.



6/1/99 | FIGURE 6-1 TOP 25 PROJECTS - MAP | CVC - PHASE 2 | MK CENTENNIAL ENGINEERING Inc.

The initial list of 122 projects was developed by reviewing previous transportation plans and from comments received from the public during Model development. It included various transportation projects such as traffic signals, freeways, bus routes, commuter rail lines, and west/east bypasses. Project Workshop participants (Workshop #1 of May 17, 1999) decided which projects were feasible and provide the greatest system-wide mobility benefits. The goal was to reduce the list to a manageable number under 40.

The list of 40 projects was later reduced to 25 with the objective of choosing projects that improved congestion on a regional level and not just in one locale. This list of 25 was developed by the CMPO Executive Council, UDOT, and local government representatives (Workshop #2 of June 7, 1999) and was based partly on preliminary cost estimates. The list of 25 candidate projects was analyzed and ranked based on cost estimates and mobility benefits.

2. Mobility and Cost Effectiveness

The remaining 25 projects were ranked using the Evaluation Criteria established by the local government workshop group (see sub-section D). Mobility and Cost Effectiveness have a 30% and 40% level of importance, respectively. Planning level cost estimating was used to determine the cost of each of the remaining projects (see Technical Memorandum #2, Identify Projects, Appendix B). The total estimated construction cost of these projects was $312 million, which was well beyond the CMPO budget. Therefore, further project elimination was necessary.

Tables 6-1a and 6-1b list the remaining candidate projects in two forms. Table 6-1a shows the ranking based only on mobility benefits; Table 6-1b

shows the ranking based on all the evaluation criteria. The Top ten projects listed in Table 6-1b (Tier 1 and 2) were evaluated using the screening process described in sub-section E. Note that Tier 1 and 2 projects (except for the 200 N/400 N project) are north-south connectors. This is due to the geographical configuration of the LUA which results in congestion occurring mostly in this direction. Exisitng east-west roads will carry existing and projected traffic.

TABLE 6-1A INTERIM EVALUATION RESULTS (MOBILITY BENEFIT ONLY)

Mobility Rank	Project # (1)	Facility	Limits	Delay Reduction (2)	
				Total	Main St only
Tier 1 - TSM Projects on Main Street					
1	35	Main St parking replacement	1400 North - 400 North	2.13%	29.6%
2	44	Main St intersections	1400 North - 400 North	N/A	14.8%
3	34	Signal coordination	1800 North - 800 South	N/A	9.7%
4	122	Main St access mgmt.	1800 North - 700 South	N/A	1.9%
Tier 2 - Principal Build Projects					
5	12	100 East	400 North - 100 North (P)	14.12%	N/A
6	74,28,93	400 East	400 North - Millville	13.79%	N/A
7	79b	200 East (South)	400 North - Millville	13.18%	N/A
8	79a	200 East (North)	100 North (S) - 400 North	11.91%	N/A
9	109	400 West	600 South (S) - 2500 North	10.86%	N/A
10	93b	Dugway replacement	400 N/600 E - Center/400 E	6.54%	N/A
11	141	Eastside bench route	Logan - Providence	4.96%**	N/A
12	66	200/400 North	1500 West - Main Street	4.03%	N/A
13	121a	600 East	600 South (S) - 400 North	2.41%	N/A
Tier 3 - Other Build Projects With Little Potential For Mobility Enhancement					
14	65	1000 West	2500 North - Hwy 89/91	0.94% **	N/A
15	121b	800 East	600 South (S) - 700 North	0.66%	N/A
16	89	3100 North	Main Street - 1600 East	0.59% **	N/A
17	140	100 W/E (1 way pairs)	700 North - 400 South	0.54% **	N/A
18	121c	1200 East	600 South (S) - Hwy 89	0.46% **	N/A
19	28	400 East	600 South - 100 North (P)	0.43% **	N/A
20	84	1800 North	1000 West - Main Street	0.40% **	N/A
21	64	Parkway Rd.	SR-165 - 1400 East	0.40% **	N/A
22	93a	400 East	Center Street - 600 South	0.33% **	N/A
23	88	2500 North	Main Street - 1600 East	0.00% **	N/A

Notes:

** Values shown assume that the following projects are constructed: Project #1,7,8,9,12 (Mobility rank #)
(P) Providence, (S) Smithfield

N/A - Not Applicable

(1) Project numbers reference the original list of 122 projects.

(2) Delay reduction was determined differently for the TSM and build projects - The actual delay values should not be compared between the two sets. Delay is measured in vehicle hours per day.

TABLE 6-1b INTERIM EVALUATION RESULTS (EVALUATION MATRIX RANKING)

Overall Rank	Project # (1)	Facility	Limits	Score
Tier 1 - TSM Projects on Main Street				
1	35	Main St parking replacement	1400 North - 400 North	0.708
2	122	Main St intersections	1400 North - 400 North	0.167
3	44	Signal coordination	1800 North - 800 South	0.162
4	34	Main St access mgmt	1800 North - 700 South	0.154
Tier 2 - Principal Build Projects				
5	12	100 East	400 North - 100 North (P)	0.571
6	79b	200 East (South)	400 North - Millville	0.364
7	142	400 East	400 North - Millville	0.306
8	79a	200 East (North)	100 North (S) - 400 North	0.245
9	109	400 West	600 South (S) - 2500 North	0.240
10	66	200/400 North	1500 West - Main Street	0.219
Tier 3 - Other Build Projects With Little Potential For Cost Effective Mobility Enhancement				
11	18	1400 North	1000 West - 1200 East	0.108
12	140	100 W/E (1 way pairs)	700 North - 400 South	0.107
13	19	1700 South	Hwy 89/91 - 200 West (P)	0.092
14	121a	600 East	600 South (S) - 400 North	0.092
15	121c	1200 East	600 South (S) - Hwy 89	0.088
16	95	600 South (RH)	400 East - 1000 West	0.087
17	101	600 South (S)	Main Street - 1200 East	0.085
18	84	1800 North	1000 West - Main Street	0.084
19	141	Eastside bench route	Logan - Providence	0.083
20	121b	800 East	600 South (S) - 700 North	0.082
21	63	1000 North	1000 West - 1200 East	0.080
22	93a	400 East	Center Street - 600 South	0.800
23	88	2500 North	Main Street - 1600 East	0.066
24	28	400 East	600 South - 100 North (P)	0.051
25	13	100 West	1000 North - 400 South	0.051
26	89	3100 North	Main Street - 1600 East	0.050
27	83	1000/1200 West	Hwy 89/91 - 3200 South	0.048
28	74	3200 South	Hwy 89/91 - 100 North (P)	0.044
29	118	3700 North (bypass)	1000 West - Main Street	0.032
30	64	Parkway Rd.	SR-165 - 1400 East	0.030
31	65	1000 West	2500 North - Hwy 89/91	-0.098

Notes:

** Values shown assume that the following projects are constructed: Project #1,7,8,9,12 (Mobility rank #)
(P) Providence, (S) Smithfield

(1) Project numbers reference the original list of 122 projects.

D. Evaluation Criteria

The projects were ranked using evaluation categories, criteria, importance percentages, and weight factors. The Evaluation Criteria table shown on Table 6-2 were adopted by local government representatives at the project Workshop on July 12, 1999. Technical Memorandum #3 (Appendix C) contains information about this Evaluation Criteria development.

Mobility and Cost Effectiveness were given a high level of importance based on the CMPO mission to ...develop an intermodal transportation system that facilitates the **efficient and economic** movement of people and goods.

TABLE 6-2 EVALUATION CRITERIA

CATEGORY		CRITERIA	
Description	Importance[1]	Description	Weight Factor[2]
Mobility	30%	* System delays (% vehicle hours reduced) * US-91 ("Y" to 1800 No.) delays (% vehicle hours reduced) * System congestion (% vehicle hours reduced) * Community linkage (number of communities linked) * Crash rate and severity (rate reduction) * Transit use (judgement) * Overall fit with community transportation plans (% matching)	5 3 3 5 2 3 1
Environmental Impacts	10%	* Wetland and wildlife habitat (acres) * Hazardous materials (factor = # sites, size, severity) * Historic structures (number) * Public facility impacts (number and type)	4 5 2 1
Socioeconomic Impacts	10%	* Encourage development per community land use plans (judgement) * Project sponsorship (yes/no) * Private displacement (number) * Neighborhood impacts - noise, etc (judgement)	2 3 5 2
Cost Effectiveness	40%	* Cost Effectiveness (% vehicle hours reduced per dollar)	5
Engineering	10%	* Construction impacts (judgement) * Floodplain (cubic feet) * Drainage structures (number and type) * Right-of-way (acres)	1 2 1 3

Notes:

1 - Category Importance must add up to 100%

2 - Criteria Weight Factors range from low =1 to high = 5

E. Project Screening Process

All ten Tier 1 and Tier 2 projects (Table 6-1b) were evaluated using modeling, preliminary engineering and preliminary environmental analyzes. Details of the screening process that was preliminary applied to the projects are explained in Technical Memorandum #4. A detailed cost analysis was developed for each of the Top 10 projects except for the following:

- Traffic signal coordination system. Cost information for this project was obtained from the 1997 (updated June 1998) Feasibility Study Report for Logan Area Traffic Signal/Communication System. Annual inflation factors were taken into account.
- 200 N/400 N from 1500 W to Main Street. This project cost was not estimated since it is already programmed for construction using UDOT funds.

The following is a summary of the modeling, engineering, and environmental analyzes:

1. Modeling

a. Transportation demand evaluation

- The analysis and evaluation used the following techniques: a macro-level county-wide transportation demand model (MINUTP), a micro-level traffic operations model (SYNCHRO), and a sketch planning technique that focused on individual project performance.

- The MINUTP model was used to evaluate those projects that involved substantial modifications to the current transportation system. These modifications include new roadways, highway extensions, roadway improvements, and street realignments.

- The SYNCHRO model was used to evaluate transportation improvements that are micro-scale in nature and can not be analyzed by the MINUTP model. These include traffic signal improvements or coordination and intersection-level improvements such as turning movement lanes. A sketch planning approach was used in conjunction with the traffic simulation model to evaluate access management improvements along Main Street (driveway consolidation/reconfiguration and raised center medians).

- Since most of the possible transportation projects involved substantial changes to the transportation network of the LUA, the MINUTP model was used first to determine which project best met the overall needs. Then the SYNCHRO model and sketch planning techniques were used to analyze the remaining projects.

b. Cache County travel demand forecasting model

The Cache County travel demand forecasting model (Model) was developed during Phase 1 of the Cache Valley Corridor Study. The necessary transportation and socio-economic data collection efforts were initiated in May of 1998. The Model was developed during the summer of 1998 and was calibrated and validated in September of 1998.

This LRP was developed for the year 2025. However, the future year model was based on year 2020 data because this was the only information available at the time the Model was developed. In addition, this approach did not affect evaluation results because many projects are needed by 2020, but only half of them can be funded. Increasing population and employment by five more years would have created the need for more projects for which there are no funds.

The Model was developed to represent average weekday traffic conditions. Five purposes were used in the trip generation, trip distribution, and mode split sub-models: Home-Based Work (HBW), Home-Based Other (HBO), Non-Home Based (NHB), Internal-External trips, and External-External trips. Both auto and transit trips were generated, although only a highway network was developed for assignment of the auto trips.

Information used to develop, calibrate, and validate the Model reflects actual conditions. The information includes data from UDOT in the form of roadway network and traffic volume information, as well as, socio-economic data from the Cache County-wide Planning and Development Office. A Cache Valley Corridor Study was conducted to obtain trip making characteristics. The extensive data collection effort included internal and external origin/destination roadside surveys, home travel surveys, on-board transit surveys, and traffic counts.

The Model was developed using the latest version of MINUTP software in conjunction with Visual Planning Environment (VIPER). The VIPER is used for viewing and editing transportation networks,

trip matrices, and data files. It works as a graphical user interface for MINUTP. The combination of MINUTP and VIPER allows for the development of a Geographic Information System (GIS) based digitized highway network of Cache County and land use patterns.

A detailed description and results of the data collection, development, and validation efforts conducted can be found in the following seven technical memorandums. These technical memorandums are available for viewing at the CMPO office.

(1) Data Collection Methodology, May 1998
(2) Model Development Methodology, August 1998
(3) Travel Analysis Zones Review, August 1998
(4) Traffic Data and Analysis Report, August 1998
(5) Future Year Baseline Model Network, January 1999
(6) Model Development and Validation Report, May 1999
(7) 2020 Baseline and Alternatives Model Development Report, June 1999

c. Project evaluation

The evaluated projects were drawn from the list of 25 projects previously identified by the local government workshop group. The projects are to become part of the future transportation system of the LUA. All 25 projects on the list were subjected to some degree of transportation analysis and evaluation. The 25 projects are listed in Table 6-1b and shown in Figure 6-1. Tier 1 and Tier 2 projects represent the Top 10 list of projects

In order to compare the pros and cons of the 25 projects, eight types of measures of effectiveness (MOEs) were developed and applied. These MOEs were subsequently narrowed down to three key measures during the final project evaluation process: system-wide vehicle hours of congestion, system-wide vehicle hours of delay, and changes in Main Street travel times. These three measures were found to be sensitive indicators of differences between alternatives and appropriate for mixing with other evaluation criteria for final project rankings.

d. Project segmentation

All of the Top 10 projects are needed to mitigate future congestion, but the project development cost for all 10 exceeds the future CMPO budget. It will take approximately 50 years to accumulate enough funds to complete all 10 projects. Therefore, this LRP focuses on the most critical portions, or segments, of the Top 10 projects. This section describes how the project segments were determined and evaluated.

The segmentation analysis was based on a quantitative approach. Travel demand data was obtained from the Model and was post-processed to extract relevant information for each predefined segment. This data was compiled for three criteria: new average daily traffic (ADT) volumes, new vehicle miles of travel, and new vehicle hours of travel. Since total travel within the network was constant for all model runs; traffic appearing on a newly constructed roadway was assumed to reflect a corresponding reduction in travel occurring on other roadways, thus improving mobility. An identification of the

relative amount of induced travel on individual segments of an improvement project was then used as an indicator of the relative importance of that particular segment compared to other segments of the same improvement project.

The segmentation analysis for roadway improvements was done in two passes. In the first pass, the definition of project segments followed strict jurisdictional considerations. In the second pass, segments were refined without following jurisdictional constraints and were based on two additional considerations. In the first consideration, some segment boundaries were not adequate from a highway network standpoint. In the second consideration, some segments appeared to be unnecessarily long, and amenable to further segmentation.

Table 6-3 depicts the results of the analysis after the segment definitions were refined. It also provides a ranking system for segments within projects and an indication of the approximate length of the segment for comparative purposes.

TABLE 6-3 MODEL RESULTS FOR FIVE BUILD PROJECTS (BY SEGMENT)

Project	Jurisdiction	Limits	Length	Relative Project			MOE Rank
				Vol (%)	VMT (%)	VHT (%)	
400 West	N Logan/Hyde Park	2500 N - 3700 N	1.9	36.0	50.2	50.3	1
	Hyde Park	3700 N - 4600 N	0.9	36.8	23.1	22.9	3
	Hyde Park/Smithfield	4600 N - 600 S (S)	1.4	27.2	26.7	26.8	2
100 East	Providence	100 N (P) - 700 S	0.7	30.0	36.3	37.0	1
	River Heights	700 S - 450 S	0.4	30.8	30.4	29.6	2
	Logan	450 S - Center St	0.7	23.1	16.3	27.8	3
	Logan	Center St - 400 N	0.7	16.0	17.1	5.6	4
200 East (South)	Millville	200 S (M) - 500 N (M)	1.1	11.6	15.5	7.8	5
	Providence	500 N (M) - 300 S (P)	0.9	15.9	17.2	9.3	4
	Providence	300 S (P) - 700 S	1.3	17.3	26.5	20.5	2
	River Heights	700 S - 350 S	0.6	19.2	14.8	12.0	3
	Logan	350 S - 400 N	1.2	36.1	26.0	50.5	1
200 East (North)	Logan	400 N - 1400 N	1.6	4.3	4.7	1.4	6
	North Logan	1400 N - 2500 N	1.8	16.0	19.2	19.9	4
	N Logan/Hyde Park	2500 N - 3700 N	1.9	15.6	21.8	19.9	3
	Hyde Park	3700 N - 4400 N	1.1	24.8	22.6	26.0	1
	Hyde Park/Smithfield	4400 N - 600 S (S)	0.9	26.0	20.9	23.8	2
	Smithfield	600 S (S) - 100 N (S)	1.3	13.2	10.8	8.9	5
400 East	Millville	200 S (M) - 500 N (M)	1.1	0.1	0.1	0.0	6
	Providence	500 N (M) - 300 S (P)	0.9	1.4	1.6	0.7	5
	Providence	300 S (P) - 700 S	1.3	17.9	25.8	14.7	3
	River Heights	700 S - 300 S	0.6	9.5	8.3	8.3	4
	Logan	300 S - Center St	0.5	37.2	23.3	20.1	2
	Logan	Center - 400 N/600 E	0.7	33.9	40.9	56.1	1

(S) - Smithfield, (P) - Providence, (M) Millville
Vol - Traffic Volume
VMT - Vehicle Miles Traveled
VHT - Vehicle Hours Traveled

Due to the integrated nature of the four Main Street TSM projects, they were less susceptible to discrete segmentation and quantitative segmentation analysis than the five roadway projects described above. However, some general findings were made using SYNCHRO

and sketch planning techniques. These are the same tools that were used to evaluate potential segmentation of other projects.

e. Main Street parking replacement

The characteristics of this project make it difficult to find a suitable break point for segmentation from a mobility standpoint.

f. Main Street access management

This project can be segmented, but there are no tools that easily lend themselves to project limit determination based on mobility. An important benefit of access management is increased safety. Therefore, segments that have a high number of accidents should be first to have such measures implemented.

A greater benefit will probably be realized in areas away from downtown, which have few mid-block entrances. Key areas for access management would be between 800 South and 300 South and between 400 North and 700 North. An initial access management effort could include adding center medians at signalized intersections, especially in the suburban area of 1000 North and 1400 North.

g. Main Street intersection improvements at 400 North and 1400 North

Segmentation for the intersection improvement projects at 400 N and 1400 N on Main Street would likely be in the form of reconstruction. Currently both intersections operate at LOS C, with 1400 N having a

larger delay of 3 seconds. In 2020 both intersections will operate at LOS F, with the average delay at 1400 North being about 30 seconds longer than 400 N. Based on this, the intersection of Main Street and 1400 N should be reconstructed first.

It is important to note that the 200 N/400 N realignment project will have an impact on the intersection of 400 N and Main Street. If this project is constructed before improvements to the 1400 N intersection, then the 400 N intersection should take priority over 1400 N. The 400 North intersection improvements and construction of the 200-400 N realignment project should be done together in order to minimize costs and impacts.

h. Traffic signal coordination

Implementation of traffic signal coordination along Main Street is not readily segmented. However, coordination benefits are realized in the downtown area between 400 S and 700 N in Logan. Coordination on Main Street in downtown between 400 S and 700 N gives an estimated 28% reduction in delay while it only gives an 11% reduction north of 700 N. Therefore, coordination in the downtown area should receive priority.

2. Engineering

a. Preliminary Project Development Cost Estimate

Preliminary cost estimates were developed in the following manner.

(1) Data collection: inventory of existing sidewalks, parkways, and

pavement widths.

(2) Conceptual road alignment: conceptual road alignments were developed with the use of aerial mapping.

(3) Conceptual design. An agreement was reached on the cross-section geometry for each of the projects.

(4) Construction cost estimates. Preliminary cost estimates were based on the UDOT's 1998 Average Unit Cost and Numerical Bid Item List and included the following elements: sidewalk, pavement, curb, gutter, retaining walls, drainage structures, bridges, excavation, import and export of borrow, signing, striping, traffic control, traffic signals, and mobilization.

(5) Other project development costs. Also included in the preliminary cost estimate is environmental, engineering, construction management, and ROW acquisition costs.

b. Critical segments

The following project segments required careful attention due to existing physical constraints and/or environmental issues:

(1) Dugway Replacement, Center Street/400 E to 400 N/600 E. (environmental and access to homes)

(2) 200 E from 100 S to Center Street (park and BSA office)

The cost estimates (Appendix D) are preliminary and do not represent actual project development costs. They will vary depending on construction scheduling and specific alignment determination. The next level of cost estimating should happen during development of "concept reports" for each project.

The cost estimates were used in the project ranking to determine cost effectiveness. The cost effectiveness category (% vehicle-hours reduced per dollar) accounted for 40% of the evaluation criteria (Table 6-2).

3. Environmental

A cursory evaluation of social, economic, and environmental resources was conducted on the 25 listed projects to assist in the screening evaluation. A more detailed preliminary environmental fatal flaw analysis was conducted and used in the screening evaluation for the Top 10 projects under consideration. Details of the fatal flaw analysis are presented in Technical Memorandum # 4 (Appendix D).

a. Title VI and environmental justice

Title VI of the Civil Rights Act of 1964 and related statues assure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination on the basis of race, color, national origin, age, sex and disability. Executive Order 12898 states in part that federal agencies shall identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs and activities on minority and low-income populations. The major difference is that EO 12898 adds low-income populations when examining effects of programs, policies, and activities. Wherever minority and low-income population are referenced herein, age, gender, and disability are also assumed to be included.

General understanding of the population composition was obtained from information provided by the Technical Committee, workgroup participants, the Countywide Planning Office and the public, along with field observations. Families and individuals residing along the project corridors include long- and short-term renters and homeowners. Low-income, minority, elderly and handicapped individuals are likely along the corridors that travel through neighborhoods (i.e., 100 East, 200 East, and 400 East). No major concentrations of minority or low-income populations are known to occur in the study area. Minority and low-income composition of the population in the specific project corridors is expected to be typical of most areas in Cache Valley.

The downtown (Main Street) Commercial Business District consists mainly of older, small businesses. No information on income level or minority ownership was obtained for these businesses, as the Main Street projects are not expected to adversely affect the Business District. No other social groups or persons with special needs have been identified through the public involvement process within the project corridors.

Based on this understanding, in accordance with Title VI and EO 12898, the projects are not expected to have any disproportionate and/or adverse human health or environmental effects on minority and/or low income households. As individual projects advance through concept development and preconstruction, further analyses will be required to ensure that the requirements Title VI and EO 12898 are met. These analyzes may create alignment modifications and/or change other anticipated impacts.

b. Commercial / non-commercial relocations and cultural resources

The Top 10 list of projects will likely require some 32 non-commercial and two commercial relocations, of which 15 are potentially historic. Within the proposed 200 East project corridor there are three areas of historic value: 1) a mill site located in Millville, 2) a historically sensitive area located along the shallow bench overlooking the flood plain in Millville, and 3) the Logan Temple. The Logan Center Street Historic District is another area where maintaining the historic character of the district needs to be considered. Also, two sensitive areas occur along the 100 East and 400 East corridors: 1) 100 East - the Logan Tabernacle and 2) 400 East - a unique historic residence located at the intersection of 200 South and 200 West in Providence (See the Environmental Report in Appendix D for more information).

c. Wildlife, threatened and endangered species

According to the United States Fish and Wildlife Service, no endangered or threatened species are located in any of the project areas. Three State-listed sensitive species, the western toad, black swift, and grasshopper sparrow, were identified as potentially occurring in the project areas by the Utah Natural Heritage Program. However, impacts to the black swift and western toad are unlikely. There is more potential to impact the grasshopper sparrow, which occurs in prairies and cultivated grasslands.

There are two sensitive species found within the project areas. The first is the Ring-necked pheasant which is found throughout Cache Valley year-round. The second is the Hungarian partridge, found year-round in the area between River Heights and Millville. Both are introduced game bird species.

The general areas of concern for wildlife and wildlife habitat are wetland ecosystems because of the concentration of species and productivity of the systems.

d. Jurisdictional waters/wetlands

Approximately 22 acres of wetlands will be impacted by the Top 10 listed projects, with the 400 West project having the greatest impact of over 11 acres. The Corp of Engineers' Section 404 permitting regulations require that wetland impacts, direct or indirect, are avoided and/or minimized to the maximum extent practicable. At the project level, additional analysis will be required to identify alignment modifications that would reduce or eliminate the wetland impacts.

e. Hazardous material and well locations

Two sites with potential for hazardous materials are adjacent to or within project boundaries. On 400 East an auto workshop lies adjacent to the project, while a construction site lies within the limits of the 400 West project. Several properties along Main Street also have potential to contain hazardous material. No wells were identified within the project boundaries.

f. Farmland

Much of the farmland affected by the listed projects exists within city limits and is, therefore, not protected under the Farmland Protection Act. The majority of Cache Valley outside of municipal boundaries is National Resources Conservation Service designated Prime or

Important Farmland. The projects will impact about 27 acres of prime farmland and 85 acres of non-prime farmland.

g. Section 4(f)/6(f) properties

Six Section 4(f) properties were identified which lie close to or in the path of the listed projects. All six properties are parks. The North Park Equestrian Park, located at approximately 2700 North and 200 East, will be segmented by the 200 East (North) project. Other parks identified include Bridgerland Park, Logan Downtown Park, Lee Park, Meadow View Park, and Providence Park. These properties also qualify as Section 6(f) properties, which are lands purchased or improved with Land and Water Conservation Funds.

h. Noise impacts

Numerous residences adjacent to the proposed projects are considered potential noise receptors. However, there are only a few locations where the roadway traverses along the back of the property and direct access would not be required from the roadway. Noise mitigation, in the form of a noise barrier, may be considered reasonable or feasible at these locations, if a noise impact is identified at the project level. In other areas, noise impacts, even if recognized, would likely not be mitigatable due to openings that would be required in any barrier in order to provide accesses to these properties.

F. Final Project Ranking - Top 10 Projects

The final Top 10 project ranking was developed utilizing all of the factors in the Evaluation Criteria table (Table 6-2). These recommendations are purely technical in nature and do not represent political factors or local funding limitations. The Top 10 projects are listed in Table 6-4.

TABLE 6-4 TOP 10 PROJECTS

Rank (Score)	Project	Jurisdiction	Limits
TSM #1 (0.708)	Main St Parking Replacement	Logan	400 North - 1400 North
TSM #2 (0.553)	Signal Coordination	Logan/ North Logan	800 South - 1800 North
TSM #3 (0.504)	Main St Intersection Improvement	Logan	400 North, 1400 North
TSM #4 (0.183)	Main St Access Management	Logan/ North Logan	800 South - 1800 North
Build #1 (0.581)	100 East	Providence River Heights Logan	100 North (P) - 400 North
Build #2 (0.333)	200 East (South)	Millville Providence River Heights Logan	200 South (M) - 400 North
Build #3 (0.290)	400 East	Millville Providence River Heights Logan	200 South (M) - 400 N/600 E
Build #4 (0.278)	400 West	North Logan Hyde Park Smithfield	2500 North - 600 South (S)
Build #5 (0.268)	200 East (North)	Logan North Logan Hyde Park Smithfield	400 North - 400 South (S)
Build #6 (0.213)	200/400 North	Logan	200 N/1500 W - 400 N/Main St

(P) - Providence, (S) - Smithfield, (M) - Millville

The list of the Top 10 projects shown in Table 6-4 was presented to citizens and public officials at Workshop #5 on January 10, 2000. The Top 10 list was approved and segments were evaluated at the same meeting to arrive at a financially constrained list (Section 8, Financially Constrained Plan for Roadway Projects).

The congestion map in Figure 6-2 shows the projected levels of congestion with the construction of the Top 10 projects.

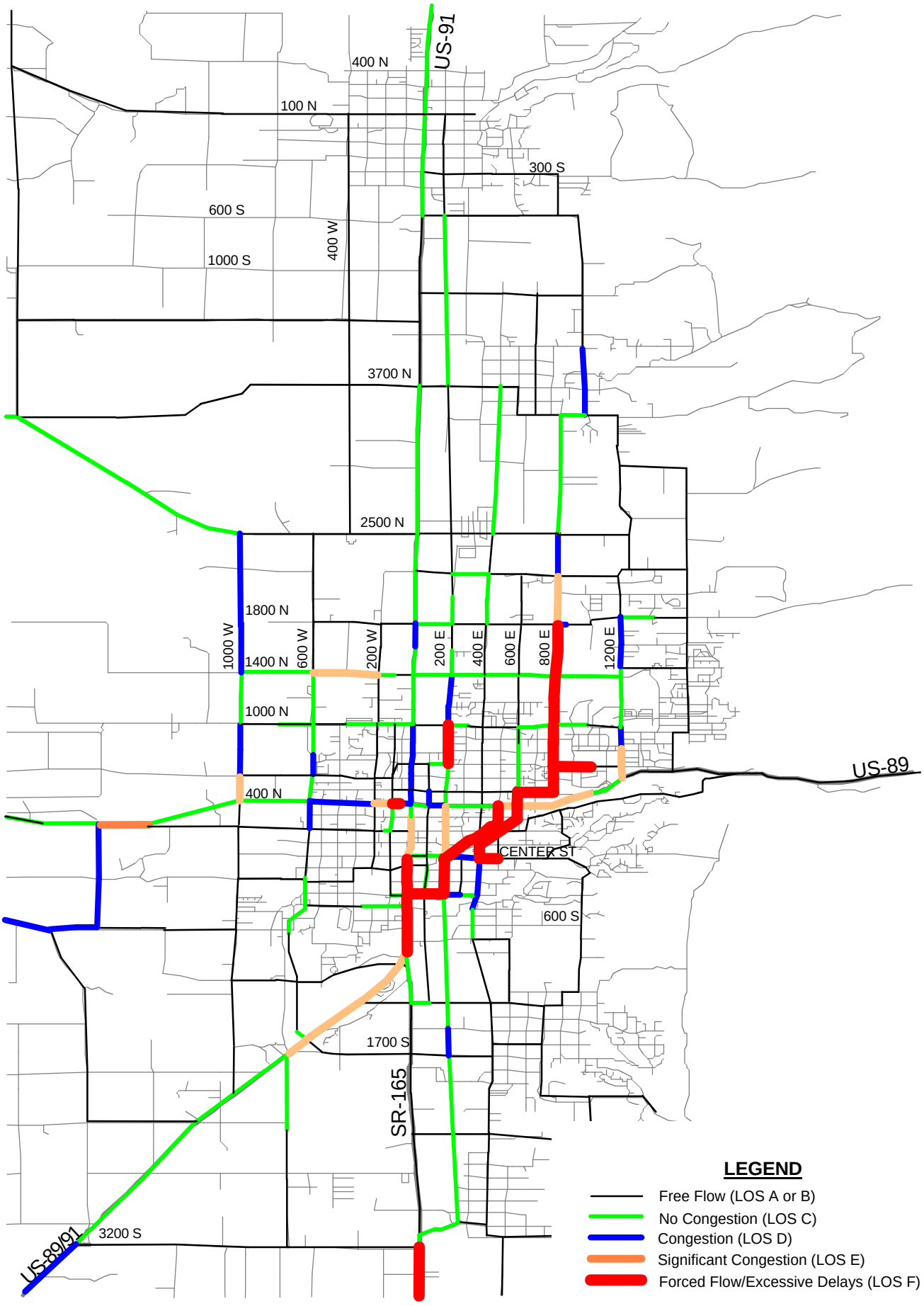


FIGURE 6-2

YEAR 2025 CONGESTION MAP WITH TOP 10 PROJECTS

SECTION 7 - REVENUE SOURCES AND FUNDING PROJECTIONS

Federal regulations address a financial plan as follows:

> "A financial plan that demonstrates how the adopted long-range transportation plan can be implemented, indicates resources from public and private sources that are reasonably expected to be made available to carry out the plan, and recommends any additional financing strategies for needed projects and programs. The financial plan may include, for illustrative purposes, additional projects that would be included in the adopted long-range transportation plan if reasonable additional resources beyond those identified in the financial plan were available. For the purposes of developing the long-range transportation plan, the MPO and State shall cooperatively develop estimates of funds that will be available to support plan implementation."
>
> Source: Section 1203, Metropolitan Planning, TEA-21 Guide

The Financial Plan (FP) is shown in Technical Memorandum #1 (Appendix A) and it estimates the revenue sources to determine the available funds through the year 2025. This financial analysis was based on past trends and future revenue estimates. The following subsections and Table 7-1 summarize the information provided in the financial plan and give a general idea where the money comes from.

This plan assumes that $3 million in federal discretionary funding will be obtained by the community over the next 25 years (Possibly 3 federal highway funding reauthorization bills). This is a reasonable assumption based on the LUA's history of obtaining discretionary funds. For example, the community obtained $8 million of discretionary funds under TEA-21 for the "Cache Valley Highway" project.

A. Roadway Projects

1. Federal Funding

The following federal programs are considered funding sources for roadway transportation projects, as administered by the FHWA. For a complete listing of potential funding sources for transportation projects, please see page 17 of Technical Memorandum #1 (Appendix A).

a. The Transportation Equity Act for the 21st Century (TEA-21)

TEA-21, a continuance of the Intermodal Surface Transportation Efficiency Act (ISTEA), established the following funds:

(1) Interstate Maintenance
(2) National Highway System
(3) Surface Transportation Program (STP)
(4) STP Safety and Enhancement Programs
(5) Bridge Replacement Programs
(6) High Priority Fund

b. State funding

The most relevant state funds used for roadway projects are:

(1) Highway User Fees such as:
    (a) Motor fuel taxes
    (b) Special fuel taxes

(c) License fees
(d) Registration fees
(e) Rental cars taxes
(f) Sales taxes

(2) Centennial Highway Endowment Fund

(3) State general fund

2. Other funding sources

a. Local

There are three main sources of revenues for transportation projects at the local level:

(1) CMPO Surface Transportation Program (STP)
(2) Class B and C Funds for Counties and Cities
(3) Local general funds

b. Private

As development occurs, local agencies can require roadway improvements to be funded by private developers through the following programs:

(1) Developer impact fees
(2) ROW preservation through property dedication

(3) Construction of roadway improvements adjacent to development

Although these programs have not been fully adopted by local agencies in the LUA, they are expected to be implemented within the period of this LRP.

The CMPO will help local agencies incorporate the LRP recommended projects into individual city plans. The cities can begin preserving needed ROW and construction improvements based on the LRP.

B. Transit Projects

1. Federal Funding

The FTA regulates the revenue sources for transit capital and planning. Two major transit funds were considered in the funding projections:

a. Urbanized area formula program

This is a capital improvement program for planning and maintenance of transit projects or systems.

b. Capital program grants

This is a capital improvement program for buses and/or construction of operation and maintenance facilities.

c. State funding

Metropolitan Planning Fund. This program provides for planning studies by local agencies and is allocated by the FTA through UDOT

2. Other funding sources

a. Sales and use tax
b. A 1/4 cent sales tax and associated institution of the CVTD expansion (November 2000 public referendum)

The following table provides a summary of projected roadway and transit revenues through the year 2025.

TABLE 7-1 PROJECTED REVENUE SUMMARY 1998-2025

Source	**Roadway** (millions)	**Transit** (millions)
Federal Funds	$ 51*	$ 22
State Funds	$148	$ 0
Local B (County) and C (City) Funds	$336	$ 0
TOTAL REVENUES	**$535**	**$ 22**

* Assumes $3 million in discretionary federal funding earmarked for specific CMPO roadway projects.

The CMPO has programmed a financially constrained list of roadway projects (see Section 8) based on estimated Federal Funds of $51 million.

C. Non-Motorized Vehicle Facilities

There are various funding sources that should be investigated to possibly fund non-motorized facilities and programs. Refer to the CMPO Long Range

Pedestrian/Bicycle Plan (1999) (Appendix F, pages 40 thru 42) for a description of the following funding programs.

A. Federal

A. Surface Transportation Program/National Highway System
B. Transportation Enhancement Funds
C. FTA's Section 5307

B. State

A. State's General Fund
B. Class B & C Programs
C. Safe Sidewalk Program
D. Off-road Trails Program
E. Non-motorized Trails Program

Note: Number 4 and 5 above may not count as transportation enhancement projects under state requirements.

C. Local

A. Capital Improvement Program
B. General Gas Tax Funds

D. Private

A. Local government land development requirements

SECTION 8 - FINANCIALLY CONSTRAINED PLAN (FCP)

In an era when funding for transportation projects is extremely limited compared to the needs, state and local agencies face difficulty in deciding which, when, and how a project is built. The following subsections explain how roadway, transit, and non-motorized projects will use the funding identified in Section 7.

A. Roadway Projects

The money needed to implement the Top 10 Project list (see Section 6 - F) amounts to approximately $83 million. However, the forecasted roadway improvement revenue is only $51 million. Only some of the projects can be built. The projects were segmented, ranked, and put through a screening process in order to reduce the needed funds and create the FCP.

The construction of the Top 10 projects would provide more congestion mitigation than the construction of only $51 million worth of projects. Eventually, all Top 10 projects should be built. Figure 6-2 in Section 6 visually shows future traffic congestion if all Top 10 projects are constructed.

The following sections describe how the number of priority projects/segments was reduced to match the funding. Refer to Technical Memorandum #4 for detailed information, reports, and summaries of meetings related to this process.

1. Project Segmentation

a. Segmentation based on jurisdictions

Since most proposed projects have north-south orientation and cross jurisdictional boundaries, city limits were the starting point for segmentation. The segments were then analyzed based on their mobility benefits.

b. Segmentation based on modeling

Segmentation based on quantitative modeling data was the second step in project segmentation. The four TSM projects along Main Street were analyzed with SYNCHRO to determine where Main Street traffic signals and left-turn signal phasing are likely to be needed. The remaining five roadway projects were analyzed based on forecasted daily traffic with focus on congestion reduction. The MINUTP model was used to obtain this information. The LUA congestion problems are associated with the lack of north-south connectivity so all of the north-south projects should be constructed when funding is available.

c. Segmentation based on physical constraints and logical analysis

The final segmentation and ranking determination was based on logical transportation network considerations. This resulted in only minor modifications to the previous segmentation results. Table 8-1 provides the final segmentation recommendations.

TABLE 8-1 FINAL PROJECT SEGMENTATION

Project	Jurisdiction	Segment Limits
Main Street Parking Replacement	Logan	400 North - 1400 North
Signal Coordination	Logan/North Logan [3]	800 South - 1800 North
Main Street Intersection Improvements	Logan Logan	400 North 1400 North
Main Street Access Management [1]	Logan Logan Logan Logan Logan/North Logan [3]	800 South - 450 South 450 South - 50 South 50 South - 450 North 450 North - 850 North 450 North - 1800 North
100 East	Providence River Heights Logan Logan	100 North (P) - 700 South 700 South - 450 North 450 North - Center Street Center Street - 400 North
200 East (South)	Millville Providence Providence River Heights Logan	200 South (M) - 500 North (M) 500 North (M) - 300 South (P) 300 South (P) - 700 South 700 South - 350 South 350 South - 400 North
400 East	Millville Providence Providence River Heights Logan Logan	200 South (M) - 500 North (M) 500 North (M) - 300 South (P) 300 South (P) - 700 South 700 South - 300 South 300 South - Center Street Center St/400 E - 400 N/600 E
400 West	North Logan/Hyde Park [2] Hyde Park Hyde Park/Smithfield [3]	2500 North - 3700 North 3700 North - 4600 North 4600 North - 600 South (S)
200 East (North)	Logan North Logan North Logan/Hyde Park [3] Hyde Park Hyde Park/Smithfield [3] Smithfield	400 North - 1400 North 1400 North - 2500 North 2500 North - 3700 North 3700 North - 4400 North 4400 North - 600 South (S) 600 South (S) - 400 South (S)
200/400 North	Logan	200 N/1500 W - 400 N/Main St

Notes:

1 - Segmentation and ranking based on crash analysis ('95-'98)

2 - Segmentation is multi-jurisdictional; more feasible to segment this way because east/west road exists at 3700 N, but not at the boundary between North Logan and Hyde Park (2900 N)

3 - Segment is multi-jurisdictional; based on traffic model results

2. Segment Screening Process

Once the projects were segmented and ranked based on all the factors in the Evaluation Criteria Table (Table 6-2), a reduction or screening of the number of projects took place so construction costs matched available funding. Three factors were considered and applied in this project screening process. They were confirmed by local government representatives at Workshop #5 (see Appendix D, Technical Memorandum #4).

a. Political and local funding support

Local governments are expected to fund approximately 20% of transportation improvements within their jurisdictions. Therefore, it is important to consider their funding capabilities in determining which roadway segments will be matched with 80% from CMPO funds.

A project sponsorability survey was conducted from September thru November, 1999. Elected officials were asked to indicate their financial and political support for each of the segments within their jurisdictions. Negative responses were used to eliminate segments from the FCP. Each project on the FCP has the support of the community it passes through. Financial and political support for a project means that the community wants the project and they are willing and capable of funding their 20% match. The projects listed below were screened due to a lack of political and local funding.

(1) 200 East (south) - 200 South (M) to 500 North (M)
(2) 200 East (south) - 700 South to 350 South
(3) 200 East (south) - 350 South to 400 North

(4) 400 East - 200 South (M) to 500 North (M)
(5) 400 East - 700 South to 300 South
(6) 200 East (north) - 400 North to 1400 North

The segment sponsorship commitment may change in the future with changes in local government leadership and funding capabilities.

b. Private and/or local agency funding

Segment construction on the part of local jurisdiction and/or private land developers was used to further screen segments from the FCP. The information on possible private and/or local agency funding was provided by local government representatives.

Four project segments were eliminated from the FCP due to possible private funding. These project segments are listed below. This number was greater than the segments screened due to locally funded improvements, which shows that funding for road improvements is limited at the local agency level and is required from developers.

(1) 100 East - 100 North (P) to 700 South
(2) 100 East - 700 South to 450 South
(3) 200 East (south) - 500 North (M) to 300 South (P)
(4) 200 East (south) - 300 South (P) to 700 South

c. Modified project assumptions

The third factor used in the screening process was the modification of the conceptual roadway designs and cost estimates. Rather than

reconstructing a complete new road, it was determined that some existing roads could accommodate the projected traffic volumes within their existing configuration. Two project segments were identified in this category:

(1) 100 East - 450 South (Logan River) to Center Street *
(2) 100 East - Center Street to 400 North

* 300 South to 450 South will require reconstruction and the cost reflects this.

3. Financially Constrained Roadway Projects

Table 8-2 provides the Final Roadway Project Ranking and FCP (column to the right, marked ***). With the elimination of projects and segments from the CMPO funded category, the project costs matched the available funds. This set of projects and segments are considered “constrained” or “restricted” to the available funding. They are divided into the TSM and Build projects. The non-federally funded projects or “unconstrained” project list is in Section 9.

The remainder of this section contains specific information for the financially constrained projects. This information can be used to advance projects through concept development and preliminary design. Figure 8-1 shows where the financially constrained and unconstrained projects are located. Figure 8-2 shows the estimated congestion levels in 2025 if the financially constrained projects are constructed. It is anticipated that the unconstrained segments will be constructed by local and/or private funding. Also, this LRP will be reviewed on an annual basis to determine road construction phasing and prioritization.

TABLE 8-2 FINAL ROADWAY PROJECT RANKING - "TOP 10 PROJECTS"

Project Rank [1] (score)	Project	Jurisdiction	Segment Limits	Segment Rank [1] (score)	Segment Cost (millions)	Project Cost (millions)	CMPO Funded Projects
TSM #1 (0.708)	Main Street Parking Replacement	Logan	400 North - 1400 North	1	$0.27	$0.27	***
TSM #2 (0.553)	Signal Coordination	Logan/North Logan [7]	800 South - 1800 North	1	$1.00	$1.00	***
TSM #3 (0.504)	Main Street Intersection Improvement	Logan	1400 North	1 [3]	$1.09	$1.56	***
		Logan	400 North	2 [3]	$0.47		***
TSM #4 (0.183)	Main Street Access Management	Logan	800 South - 450 South [2]	5	$0.36	$4.73	***
		Logan	450 South - 50 South [2]	4	$0.62		***
		Logan	50 South - 450 North [2]	1	$0.45		***
		Logan	450 North - 850 North [2]	3	$1.09		***
		Logan/N Logan	850 North - 1800 North [2]	2	$2.21		***
Build #1 (0.581)	100 East	Providence	100 North (P) - 700 South	2 (0.399)	$1.87	$3.52	
		River Heights	700 South - 450 South	1 (0.536)	$0.91		***
		Logan	450 South - Center Street	4 (0.094)	$1.42 [4]		***
		Logan	Center Street - 400 North	3 (0.234)	$0.02 [5]		***
Build #2 (0.333)	200 East (South)	Millville	200 South (M) - 500 North (M)	4 (0.375)	$2.64	$16.13	
		Providence	500 North (M) - 300 South (P)	2 (0.516)	$2.44		
		Providence	300 South (P) - 700 South	1 (0.524)	$3.68		
		River Heights	700 South - 350 South	3 (0.456)	$2.10		
		Logan	350 South - 400 North	5 (0.336)	$5.27		
Build #3 (0.290)	400 East	Millville	200 South (M) - 500 North (M)	6 (0.091)	$2.00	$19.75	
		Providence	500 North (M) - 300 South (P)	5 (0.106)	$2.02		***
		Providence	300 South (P) - 700 South	3 (0.352)	$4.04		
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		Logan	300 South - Center Street	2 (0.452)	$2.92		***
		Logan	Center/400 E - 400 N/600 E	1 (0.529)	$5.43		***
Build #4 (0.278)	400 West	N Logan/Hyde Park	2500 North - 3700 North [6]	2 (0.273)	$6.58	$12.80	***
		Hyde Park	3700 North - 4600 North	3 (0.196)	$4.65		***
		H Park/Smithfield	4600 North - 600 South (S) [7]	1 (0.583)	$1.57		***
Build #5 (0.268)	200 East (North)	Logan	400 North - 1400 North	6 (-0.033)	$5.71	$21.19	
		North Logan	1400 North - 2500 North	4 (0.314)	$4.66		***
		N Logan/Hyde Park	2500 North - 3700 North [7]	5 (0.175)	$5.61		***
		Hyde Park	3700 North - 4400 North	2 (0.495)	$2.65		***
		H Park/Smithfield	4400 North - 600 South (S) [7]	1 (0.564)	$1.86		***
		Smithfield	600 South (S) - 400 South (S)	3 (0.489)	$0.70		***
Build #6 (0.213)	200/400 North	Logan	200 N/1500 W - 400 N/Main	1	$7.46	$7.46	see note #8

NOTES:

1 - Ranking based on Evaluation Matrix Categories and Criteria. Scores for TSM and build projects cannot be compared to each other

2 - Segmentation and ranking based on crash analysis ('95-'98)

3 - If the 200/400 North project is constructed first, the 400 N intersection should be widened before 1400 N

4 - Cost reflects re-striping and signing only (Center St-300 South); reconstruction (300 South-450 South) and new bridge over Logan River

5 - Cost reflects re-striping and signing only

6 - Segment is multi-jurisdictional; more feasible to segment this way because east/west road exists at 3700 N, but not at the boundary between North Logan and Hyde Park (2900 N)

7 - Segment is multi-jurisdictional; recommendations are based on traffic model results

8 - The 200/400 North project is currently on the UDOT STIP; it will be funded separately so it is not included in the project/funding totals

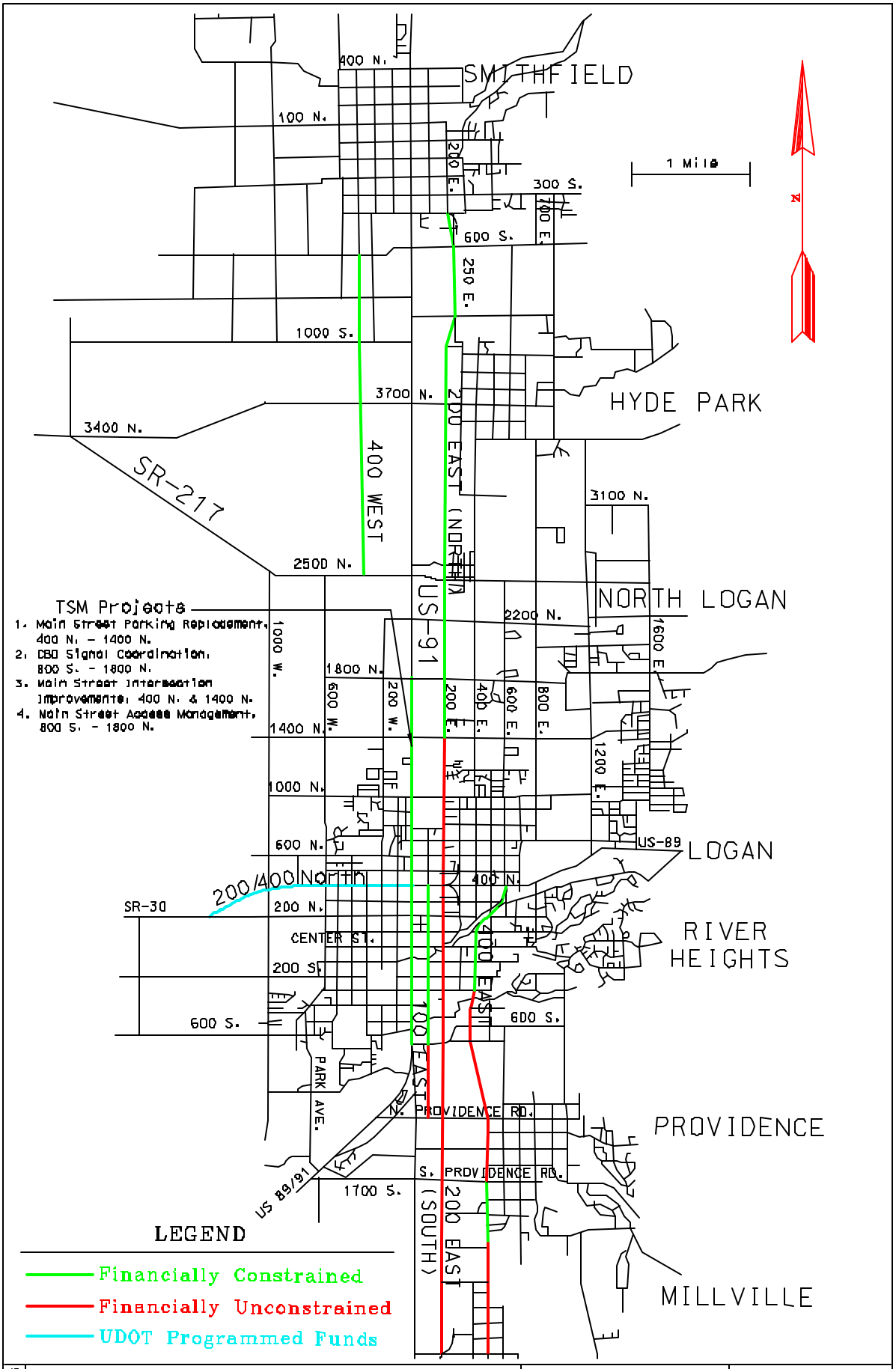
(S) - Smithfield, (P) Providence, (M) Millville

Total Cost for all roadway projects = $81 million

Total Cost for CMPO Funded Projects* = $49 million**

CMPO Projected Federal Funding through 2025 = $ 51 million

02 June 00



05/10/00 | FIGURE 8-1 TOP 10 PROJECTS - MAP | CVC - PHASE 2 | MK CENTENNIAL CENTENNIAL ENGINEERING, INC.

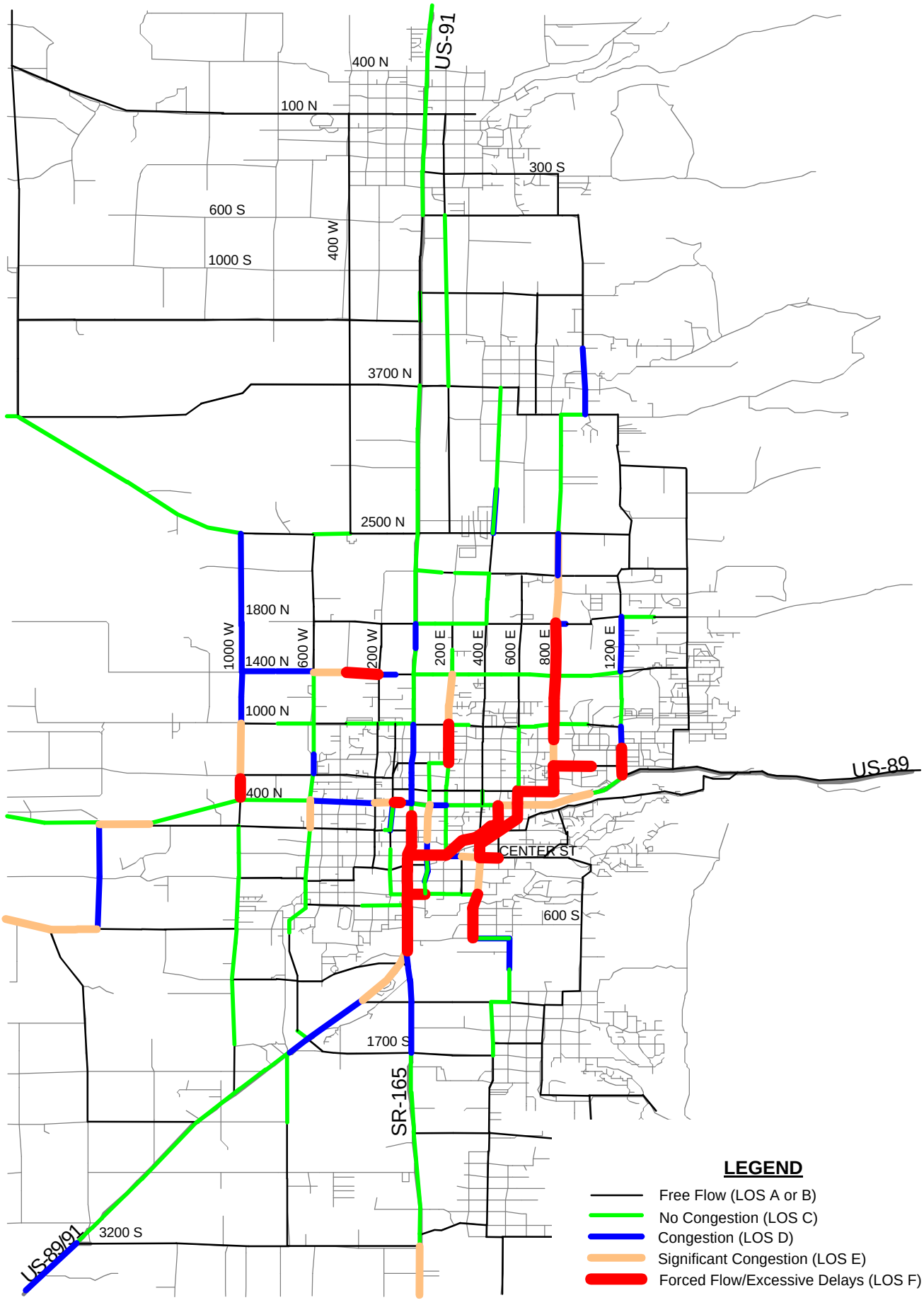


FIGURE 8-2
YEAR 2020 CONGESTION MAP WITH FCP PROJECTS

a. Transportation System Management (TSM)

These projects are all aimed at relieving congestion on Main Street (US-89/91). Main Street is classified as a Principal Arterial and is the only north-south connector through the middle of Cache County. The TSM projects are relatively inexpensive and provide greater mobility and traffic safety. In addition, they may not require environmental clearances prior to design and construction. The following table provides specific project information for the TSM projects.

TABLE 8-3 FINANCIALLY CONSTRAINED "TSM" PROJECTS ON MAIN STREET

PROJECT NAME	PROJECT LIMITS	DESCRIPTION/ JUSTIFICATION	TYPE OF WORK	Cost (millions)	POSSIBLE SOCIAL/ENV./COST FACTORS
Main Street Parking Replacement	400 N to 1400 N	Install signing and striping to create 3 through lanes in each direction needed for capacity. Relocate on-street parking to an off-street location	Restriping and signing. Construction of parking lot for public use	$0.27	Loss of on-street parking. Convenience of new public parking lot
Signal Coordination	800 S to 1800 N	Upgrade and interconnect 22 traffic signals in the CBD. Synchronization of signals is needed to reduce delay and improve safety and capacity	Traffic signal upgrade and connectivity	$1.00	None
Main Street Intersection Improvements	At 400 N and 1400 N	Widen roads at the two intersections to provide for dual left-turns in each direction. Needed for capacity and safety	Intersection modification	$1.56	ROW takes and loss of parkway
Main Street Access Management	800 S to 1800 N	Reduce traffic conflict points through: driveway consolidation/removal and installation of raised medians. Installation of left-turn phasing at signalized intersections. Needed for safety and capacity	Roadway improvements	$4.73	Reduces access points. Elimination of mid-block left-turns in/out
			TOTAL	**$7.56**	

b. New or improved roadways

These are "Build" projects in the Final Roadway Project Ranking table (Table 8-2) because they require new construction or road improvements. The 200 North - 400 North project is not listed because UDOT has already programmed funding in the Statewide Transportation Improvement Program (STIP).

TABLE 8-4 FINANCIALLY CONSTRAINED "BUILD" PROJECTS

PROJECT NAME	PROJECT LIMITS	DESCRIPTION/ JUSTIFICATION	TYPE OF WORK	Cost (millions)	POSSIBLE SOCIAL/ENV./COST FACTORS
100 East	700 S to 400 N	Construction of new segment. Signing and restriping of existing pavement. Provides an alternate north-south connector to CBD from the south	New Construction Signing and restriping	$2.35	Cost includes new Logan River bridge. Loss of open space ROW takes.
400 East	500 N (Millville) to 300 S (Providence) and 400 S to 400 N/600 E	Improve SR 238/400 E (Logan) to provide an alternate north-south connector near USU	Improve existing road. Construct new Dugway Replacement	$10.37	ROW takes, possible residential displacements. Widening of bridges over Logan River and Spring Creek
400 West	2500 N to 600 S (Smithfield)	Extend the 1000 W/600 W route to Smithfield. This route serves as an alternate westerly north-south connector	New construction	$12.80	ROW takes. Wetlands
200 East (north)	1400 N to 400 S (Smithfield)	Provide a continuous north-south connector from N.Logan to Smithfield. Provides alternate connectivity to US 91	New construction. Improve existing road (Smithfield)	$15.48	ROW takes. Wetlands. Residential displacements.
			TOTAL	**$41.09**	

B. Transit Projects

No financially constrained projects were identified in the transit category.

C. Non-Motorized Vehicle Facilities

No financially constrained projects were identified in the non-motorized facilities category. However, all FCP projects will consider non-motorized vehicle needs during final project design. Specific facilities that will be considered include:

1. Sidewalks and crosswalks
2. Pedestrian signal crossings (audible for the hearing impaired)
3. Bicycle loop detectors
4. Wide curb lanes for bicycle use
5. Pedestrian ramps at intersection corners
6. Pedestrians indicators at signalized intersections
7. Street lighting

SECTION 9 UNCONSTRAINED PROJECT LIST (UPL)

The projects, or improvements, referred to in this section are needed to mitigate future congestion, but cannot be constructed in the immediate future because of limited funds. They constitute a “wish list” pool of projects for future project selection. They have been separated into four categories depending on the function they serve: Roadway, Transit, Non-motorized modes, and ITS.

A. Roadway

This category includes nine of the projects or segments in the Top 10 category that were eliminated from the FCP and the Tier 3 projects (see Table 6-1b). Table 9-1 lists all the projects and segments on the Unconstrained Projects List. The first 11 are remaining segments from the Top 10 Projects. The remaining 19 projects provide little potential for cost-effective-mobility-enhancement over the next 25 years. All of the FCP and unconstrained projects are shown in Figure 9-1.

TABLE 9-1 UNCONSTRAINED PROJECT LIST (UPL)

Rank	Project	Limits	Estimated Cost (millions)
Segments from Top 10 Projects			
1	100 East	100 North (P)-700 South	$1.87
2	200 East (south)	300 South (P)-700 South	$3.68
3		500 North (M)-300 South (P)	$2.44
4		700 South-350 South	$2.10
5		200 South (M)-500 North (M)	$2.64
6		350 South-400 North	$5.27
7	400 East	300 South (P)-700 South	$4.04
8		700 South-300 South	$3.34
9		200 South (M)-500 North (M)	$2.00
10	200 East (north)	400 North-1400 North	$5.71
Remaining Projects			
11	1400 North	1000 West-1200 East	$10.72
12	100 W/E (one-way pairs)	700 North-400 South	$1.78
13	1700 South	Hwy 89/91-200 West (P)	$8.23
14	600 East	600 South (S)-400 North	$32.01
15	1200 East	600 South (S)-Hwy 89	$34.36
16	600 South	400 East-1000 West	$3.59
17	600 South (S)	Main Street-1200 East	$6.61
18	1800 North	1000 West-Main Street	$16.95
19	800 East	600 South (S)-700 North	$12.82
20	1000 North	1000 West-1200 East	$9.75
21	2500 North	Main Street-1600 East	$16.02
22	100 West	1000 North-400 South	$4.82
23	3100 North	Main Street-1600 East	$12.43
24	1000/1200 West	Hwy 89/91-3200 South	$7.07
25	3200 South	Hwy 89/91-100 North (P)	$23.10
26	3700 North (bypass)	1000 West-Main Street	$8.67
27	Parkway Road	SR-165-1400 East	$7.56
28	1000 West	2500 North-Hwy 89/91	$31.48

(S) - Smithfield, (P) - Providence, (M) Millville

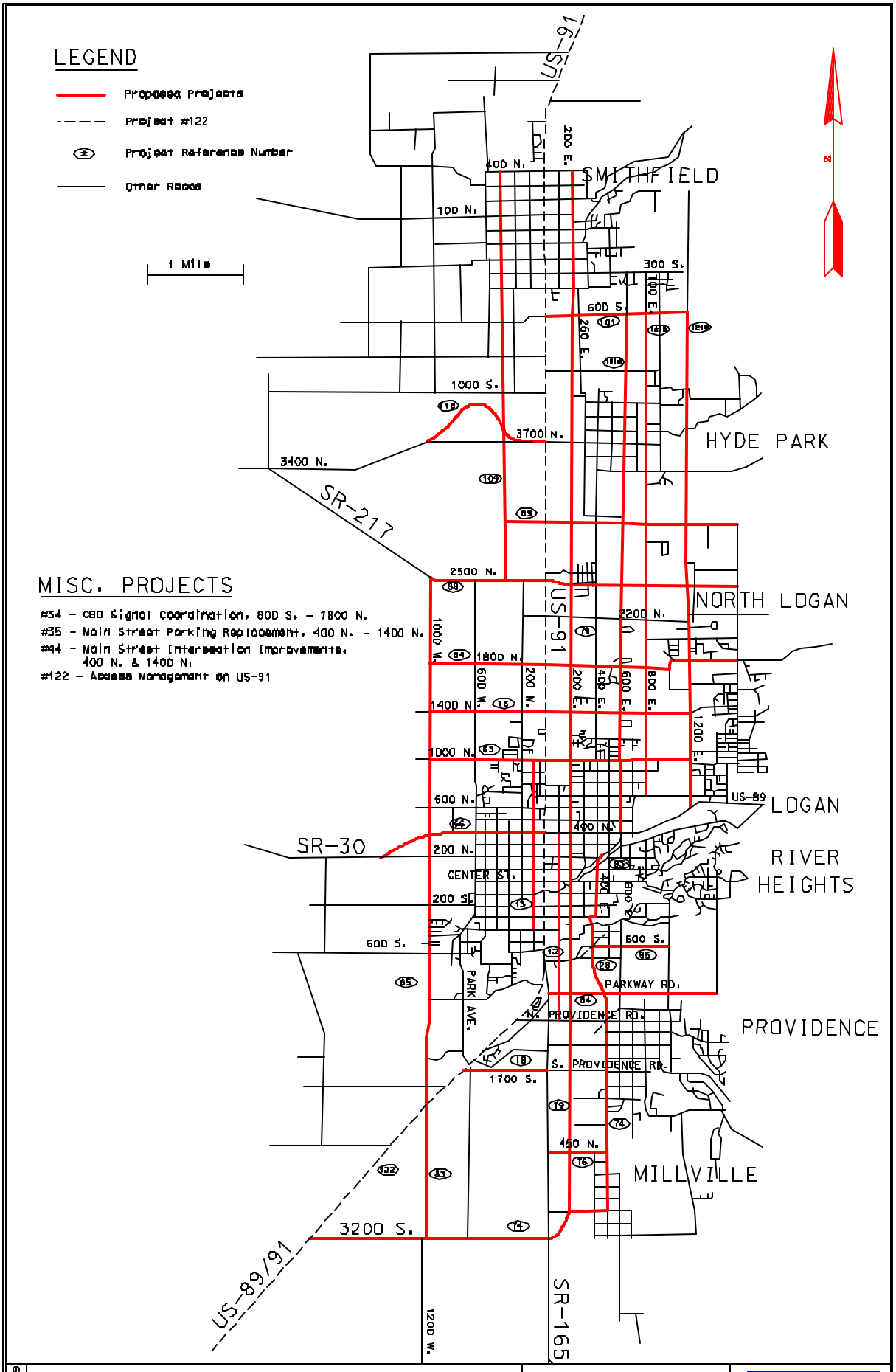


FIGURE 9-1 TOP 25 PROJECTS - MAP | CVC - PHASE 2 | MK CENTENNIAL ENGINEERING, INC.

B. Transit

Transit projects in this category include the projects listed below. They were identified in the Logan Urbanized Area Short-Range Transit Plan (1996). The funding for these projects comes from FTA and local sales taxes (see Table 7-1).

A. Bus benches
B. Bus shelters
C. Street furniture
D. Expansion and replacement buses
E. Service expansion project (CVTD)
F. Automated Vehicle Locators (AVL) systems
G. Operating costs

C. Non-Motorized Vehicles

Refer to the CMPO Long Range Pedestrian/Bicycle Plan (1999) (Appendix F, pages 43 thru 45), for listings of short and long range recommendations for non-motorized vehicle facilities and programs.

D. Intelligent Transportation Systems (ITS)

This section describes the major application groupings of the ITS. The ITS groups were obtained from FHWA's publication, "Transportation Planning and ITS: Putting the Pieces Together". Table 9-2 shows the ITS components and their potential and/or relevant application to the LUA.

1. Multi-Modal Regional Traveler Information System

This is a system that provides real time travel information to the public. Travelers can predict trip times accurately and make route and mode choices before or during a trip.

2. Incident Management

This is a program with technology that allows transportation managers to identify and respond quickly to incidents (crashes, construction, etc.) on the highway system.

3. Emergency Response Management

This system enables the rapid dispatch of emergency vehicles and personnel to the scene of an emergency.

4. Electronic Toll Collection

This is a technology that allows vehicles to go through toll plazas without stopping to pay toll fees manually. Transponders in the toll both and the vehicle communicate with each other each time a vehicle passes the toll booth.

5. Freeway Management

This is a system that automatically collects information on current traffic conditions and responds to problems by managing traffic flow with updated traveler information.

6. Transit Management

This helps manage transit fleets more efficiently and effectively. It includes electronic vehicle locators and automated dispatch systems.

7. Traffic Signal Control

This is traffic signal technology that allows the signal system to respond to real time traffic conditions, including motor vehicles, bicycles, and pedestrians, and give priority to emergency and transit vehicles.

8. Highway-Railroad Crossing Safety

This is safety technology that responds to incoming trains with enhanced warning and barrier systems at rail/highway grade crossing intersections.

9. Electronic Fare Payment

This technology allows electronic debit or credit processing of transit fares.

10. Commercial Vehicle Operations System

This is a system of comprehensive technology designed to keep freight traffic flowing through states and across interstate and international borders with limited delays and paperwork at port of entries.

11. Advanced Vehicle Control and Safety Systems

These include Collision Avoidance Programs that work through sensors in one vehicle to detect the location of other vehicles to avoid collisions.

TABLE 9-2 FINANCIALLY UNCONSTRAINED ITS APPLICATIONS IN THE LUA

#	ITS Component	Current Application	Part of State or Regional Vision	Long Term ITS Recommendations for CMPO
1	Multi-modal Regional Traveler Information System	None	Yes	-Expand electronic traffic information sharing throughout the state -Install electronic changeable message signs at strategic locations (US-91 south and north of Logan, US-89 east of Logan, and SR-30 west of Logan) to inform travelers of congestion due to special events, summer recreational activities, and road closures -Install communications connectivity infrastructure among Cache County agencies -Establish a local monitoring, control, dispatch, and information center for traffic signals, traffic congestion, transit, and weather
2	Incident Management	None	Yes	-Install video cameras at strategic locations (Main Street at 1000 W, 800 S, Center Street, 400 N, and 1400 N, US-91/Wellsville Canyon, US-89/Logan Canyon, and 400 N/600 E) to monitor traffic and detect incidents -Establish incident management teams with appropriate emergency equipment
3	Emergency Response Management	Minimal	Yes	-Expand quantity and capacity of in-vehicle computers for police, fire and medical vehicles -Establish emergency response teams within local jurisdictions with common communication mediums -Establish incident reporting, verification, and clearing responsibility agreements.
4	Electronic Toll Collection	Not Applicable	Not Applicable	Not Applicable
5	Freeway Management	Not Applicable	Not Applicable	Not Applicable
6	Transit Management	None	Yes	-Implement a computer-aided dispatch system as part of the CVTD Expansion. -Install automatic vehicle location devices on transit vehicles -Establish traffic signal priority treatment

#	ITS Component	Current Application	Part of State or Regional Vision	Long Term ITS Recommendations for CMPO
7	Traffic Signal Control	Time Based Synchronization only	Yes	-Install vehicle, bicycle, and pedestrian detection devices at all existing and new traffic signals. -Install emergency vehicle preemption devices at all existing and new signals.
8	Highway-Railroad Crossing Safety	Minimal	Yes	-Interconnect traffic signals with at-grade railroad crossings and connect to central monitoring and control location. -Install warning and barrier systems at all at-grade railroad crossing locations. -Install red-light photo enforcement technology.
9	Electronic Fare Payment	None	Yes	-Implement electronic fare payment for buses.
10	Commercial Vehicle Operations System	None	Yes	-Establish weight-in-motion system -Establish commercial vehicle route around Logan's CBD (installed truck signage for 1000 West) -Cooperate with the State's Commercial Vehicle Information Systems & Networks (CVISN)
11	Advanced Vehicle Control and Safety Systems	Not Applicable	Not Applicable	Not Applicable

SECTION 10 - CONCLUSION

The LRP recommends transit and roadway improvements to meet the transportation needs of the area over the next 25 years. Many transit improvement projects were identified during the development of the Logan Urbanized Area Short-Range Transit Plan (1996). These transit projects were incorporated into the LRP as part of the unconstrained project list. The FCP roadway projects include road improvements and TSM projects. The road improvement projects address the long-term congestion mitigation needs through 2025. The TSM projects address the short-term needs for preserving existing facilities, increasing safety, and reducing delays.

During project development, all roadway and transit improvements will consider bicycle and pedestrian needs with the goal of accomplishing an intermodal transportation system. The CMPO and its member jurisdictions will continue to apply for special federal, state, local, and private funds for motorized and non-motorized transportation.

A. Use of Available Funds

1. Prioritization of Roadway Projects

Table 10-1 shows the LRP project list with financially constrained projects in red and unconstrained projects in black. Projects or segments shown in red are road improvement and TSM projects that should be implemented as soon as funds become available. The projects or segments shown in black should also be constructed, but are categorized as unconstrained because of insufficient forecasted funds.

TABLE 10-1 FINAL ROADWAY PROJECT RANKING - "TOP 10 PROJECTS"

Project Rank [1] (score)	Project	Jurisdiction	Segment Limits	Segment Rank [1] (score)	Segment Cost (millions)	Project Cost (millions)	CMPO Funded Projects
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(S) - Smithfield, (P) Providence, (M) Millville

Total Cost for all roadway projects = $81 million

Total Cost for CMPO Funded Projects* = $49 million**

CMPO Projected Federal Funding through 2025 = $ 51 million

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2. Identified Transit Projects

Transit improvements were identified as part of the 1996 CMPO Short-Range Transit Plan (Appendix E), but are not part of the FCP due to uncertainty about the results of the referendum in November 1999.

B. Impact on Future Congestion

The LUA is experiencing traffic congestion along with increased travel time and crash rates. If no road improvements are made, traffic volumes and congestion will continue to grow uncontrolled over the next 25 years (see Figure 10-1). This congestion increases air pollution, driver frustration, crashes, delays, and is a detriment to the economy. Figure 10-2 shows future levels of congestion if the FCP projects or segments are implemented (shown in green in Figure 10-4). Figure 10-3 shows future congestion if the Top 10 projects are implemented (shown in Figure 10-4 as green, red, and blue). A comparison of Figures 10-2 and 10-3 demonstrates that congestion reduction can be accomplished by implementing as many projects as possible. FCP road improvements will help moderate the levels of congestion and maintain quality of life.

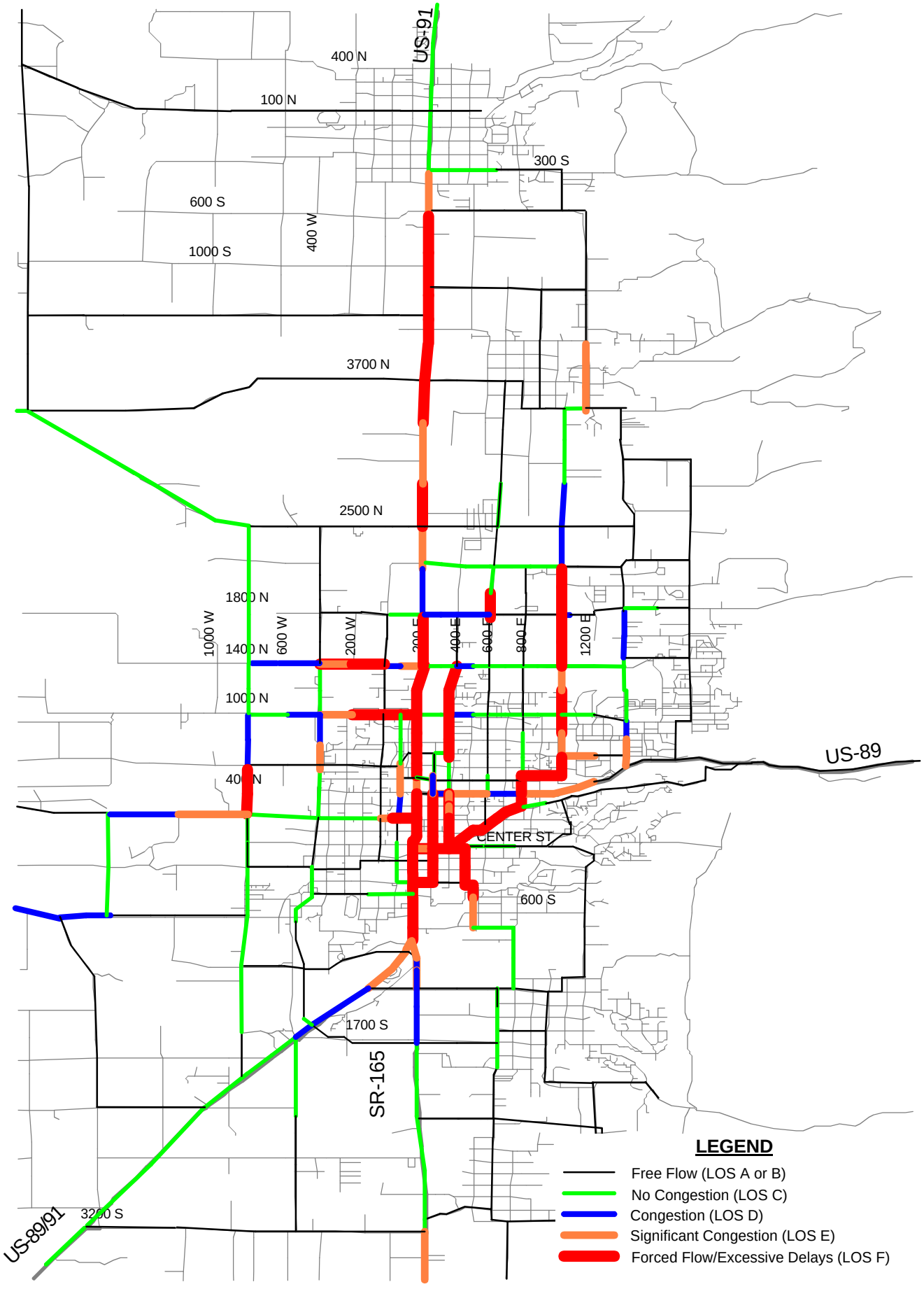

FIGURE 10-1

YEAR 2025 CONGESTION MAP
"NO BUILD" ALTERNATIVE

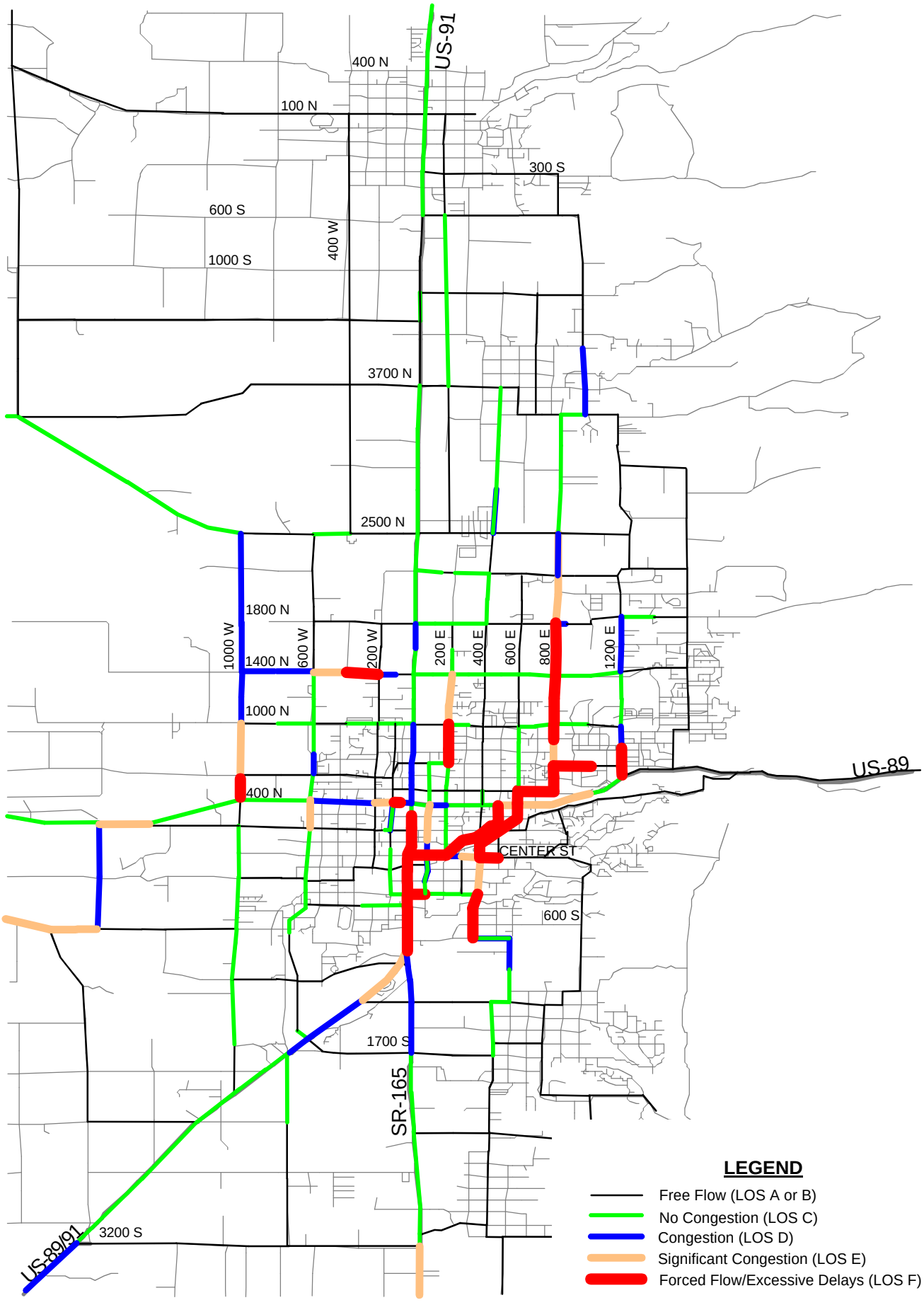

FIGURE 10-2

YEAR 2020 CONGESTION MAP WITH FCP PROJECTS

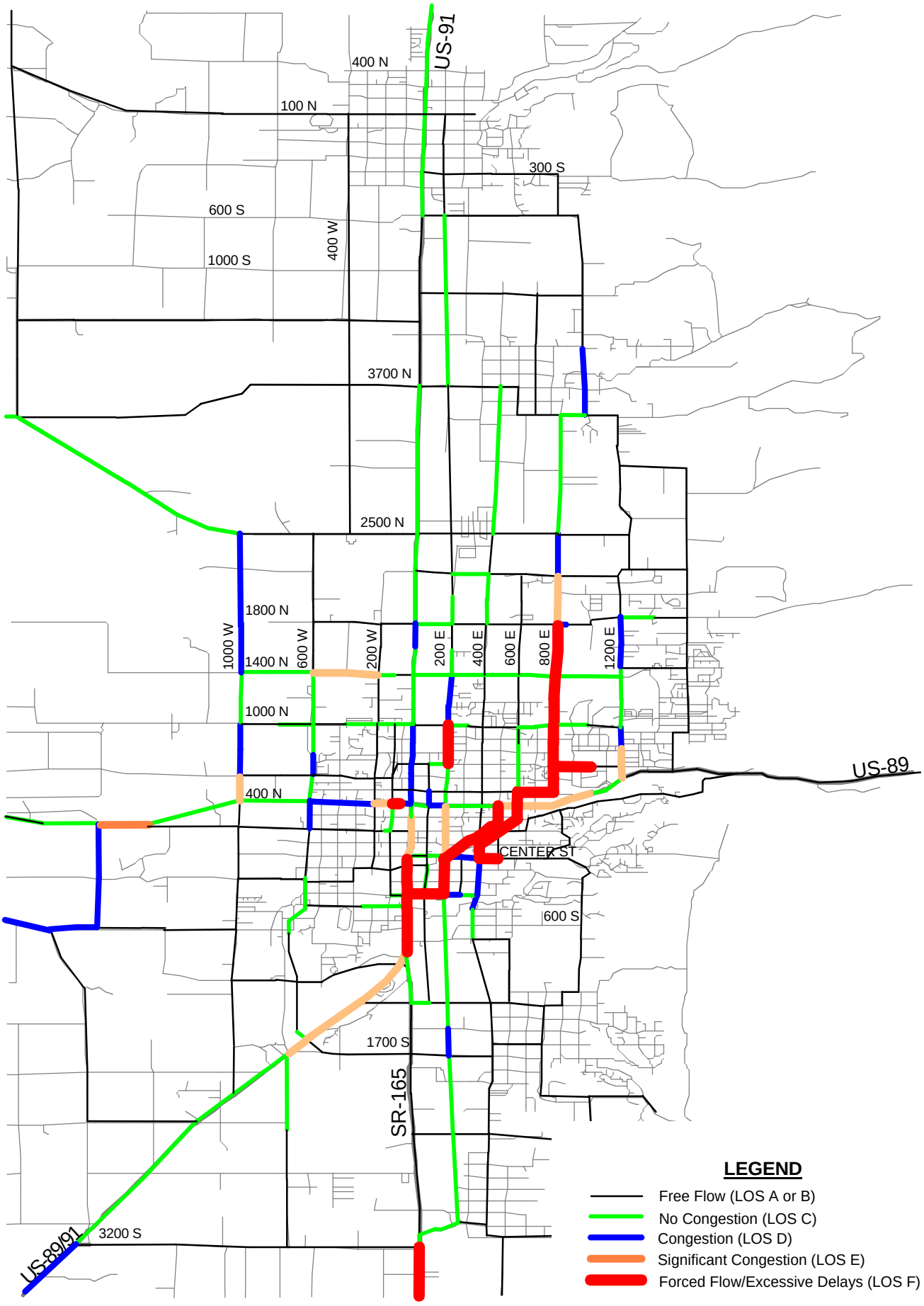

FIGURE 10-3

YEAR 2025 CONGESTION MAP WITH TOP 10 PROJECTS

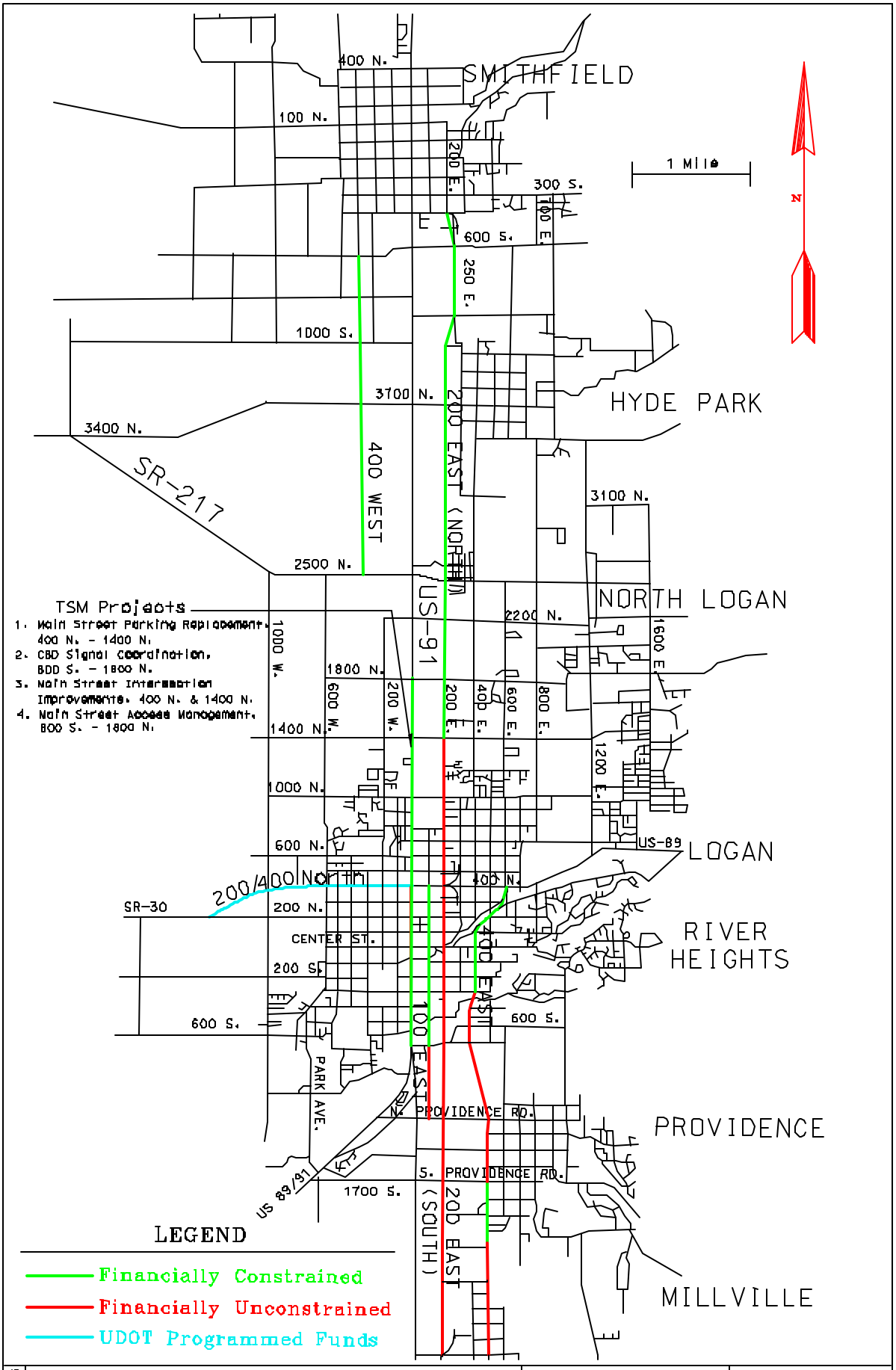

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FIGURE 10-4 TOP 10 PROJECTS - MAP

CVC - PHASE 2

CENTENNIAL ENGINEERING, INC.

C. Available Funds

Table 10-2 summarizes the estimated transportation funding for the next 25 years. The FP (Appendix A) contains detailed information on estimates of future revenue from potential revenue sources and cost estimates of projected needs.

TABLE 10-2 PROJECTED REVENUES 1998-2025

Source	Roadway (millions)	Transit (millions)
Federal Funds	$ 51*	$ 22
State Funds	$148	$ 0
Local B (County) and C (City) Funds	$336	$ 0
TOTAL REVENUES	**$535**	**$ 22**

*Assumes $3 million in discretionary federal funding earmarked for specific CMPO roadway projects.

D. Next Steps in the Planning and Implementation Process

1. Freight Considerations

Cache County has a great deal of pass-thru truck traffic en-route to Salt Lake City. Salt Lake City is a junction of I-15 and I-80 and therefore serves as a major transfer and warehousing hub for several trucking companies. The major facilities used for freight traffic in the LUA include US-89, US-91, SR-30, and SR-165. Although these facilities are included in the travel demand model used in this LRP, a regional freight study to specifically address freight needs should be conducted. A regional freight study would address the use of new technology to provide for a more efficient flow of freight traffic (refer to Table 9-2, item 10).

2. Access Management and Corridor Preservation

The CMPO should work with member agencies to strategically organize a regionally coordinated effort on access management and corridor preservation. A region-wide policy, local ordinances, and planning and zoning regulations should be implemented to regulate access and promote corridor preservation. Road access management (see Appendix J) is essential to provide a safe and efficient transportation system. It regulates access thereby increasing traffic safety, capacity, and flow. Corridor preservation (see Appendix I) is the application of measures to effectively protect ROW for planned transportation facilities.

3. Intelligent Transportation Systems (ITS)

The application of technology to the transportation system can improve transportation operations and management. ITS include the integrated use of computers, electronics, communication technologies, and management strategies to provide a safer and more efficient transportation system. The CMPO recognizes that managing the existing transportation system is just as important as expanding it. Section 9, Unconstrained Projects, introduces eleven nationally recognized ITS components with their respective CMPO recommendations. Regional coordination efforts need to take place to overcome institutional and budgetary obstacles to ITS implementation.

4. Transit System Expansion Funding

The LTD is a premier transit service provider. This system should be expanded as the CVTD. A public outreach campaign should be

implemented to help ensure the passage of the public referendum in November 2000.

5. Integrated Land Use

County-wide efforts are needed to plan land use in conjunction with the planned transportation system. The focus must be to accomplish integrated land uses where people can live and work without having to rely solely on the automobile.

6. Regional Coordination

Sub-sections D.1. through D.5. constitute the next steps in the planning and implementation process and they require regional coordination for their accomplishment. Further development of regional coordination within and outside the LUA is paramount for continued development of a safe and efficient transportation system.

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